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1981 REVISITED

Flashback: Microsoft and IBM jump-start the PC market. Page 72

IBM PC with a 4.7-MHz Intel 8088 processor

E-STRATEGY

Business QuickStudy: How to determine which model is right for you. Page 53

ERP'S NEXT STAGE

You've taken care of Y2K and your back-office function. Now it's time to reap more ERP value. Page 48

COMPUTERWORLD

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AUGUST 16, 1999 ▪ VOL. 33 ▪ NO. 33 ▪ $4 COPY

STELLA JOHNSON

DAVID LEWIS, acting CIO for the state of Massachusetts, says he likes the idea of slimmer PCs ("Give me my desktop back!") but isn't ready to give up floppies – yet

TOO MUCH TOO FAST

ARE YOU PREPARED to pry floppy disks from your end users' cold, dead fingers? Through initiatives with breezy names like Easy PC, vendors like Intel and Microsoft are fast-tracking changes that could create support nightmares. Printer port? Gone. Serial ports? Gone. VGA monitors? See ya. Frank Hayes reports that the vendors' goal is to make PCs smaller, eliminate resource hogs and cut prices. Our survey shows that IT managers support those goals but want the changes phased in. *Page 68*

OUTAGES PLAGUE IRATE MCI USERS

Some mull redress options as carrier fails to fix or explain weeklong service disruptions

BY CAROL SLIWA, DAVID ORENSTEIN AND KATHLEEN OHLSON

Perhaps 1,800 corporate users suffered disabling and sometimes costly network problems, from slowdowns to ATM and network outages, when MCI WorldCom Inc.'s unexplained frame-relay congestion stretched late into last week.

The dearth of details left angry customers and observers contrasting MCI's taciturn handling of the problem to AT&T Corp.'s more public response to its more wide-reaching frame-relay outage in April 1998. Then, AT&T Chairman C. Michael Armstrong provided swift updates; MCI executives have yet to discuss the matter.

After talking to MCI executives on Thursday night, Larry Wills, manager of telecommunications services at the U.S. Postal Service in Raleigh, N.C., said, "They didn't have a good idea of how to fix it." The Postal Service, MCI's largest frame-relay customer, wasn't affected.

"You might see some customers walk because of this," said Melanie Posey, an analyst at International Data Corp. in Framingham, Mass. At least one major user is considering legal action.

As the latest outage hit The Chicago Board of Trade Friday, CEO Thomas Donovan said CBOT is pursuing "all available remedies" in the wake of MCI's "failure to deliver on their promises to me early last week." MCI, which had promised there would be no more service disruptions, was also told that CBOT found the re-

MCI, page 89

What Was Hit

- 15% of the network
- 30% of MCI's frame-relay customers, reported to be as many as 70,000 users
- All of MCI's 16 major frame-relay switches in the U.S.
- Cities including New York, Los Angeles, Chicago, San Francisco, Boston and Denver

GM RACES TOWARD INTERNET PAYOFF

E-GM unit expected to reap $5B in five years

BY JULIA KING

General Motors Corp. is laying the groundwork for a massive migration to the Internet, which it said is key to boosting sales, cutting new car design times by half and paring manufacturing costs by up to 10%.

The auto giant expects its new e-GM unit to generate as much as $5 billion in revenue over the next five years. But the systems integration challenges involved are huge, acknowledged GM CIO Ralph Szygenda, who headed the 50-person strategic planning team that created e-GM while holed up for three months at GM's Information Systems and Services headquarters in Brewery Park, Mich.

Among his top priorities, he said, is to find a CIO to lead the new business unit, plus about 30 "top-

GM, page 89

BILL SCHWAB

GM CIO Ralph Szygenda: Wants single billing system for multiple products

INVIGORATED HP QUIETS CRITICS

Internet execution and push are winning praise

BY JAIKUMAR VIJAYAN

Attendees at this week's HP World show in San Francisco will find the mood dramatically different from a year ago.

Then, slowing revenue, declining profits and a confusing Internet strategy had critics blasting Hewlett-Packard Co. (see chart, page 16).

But since then, HP's efforts to transform itself into a one-stop vendor of electronic-business hardware, software and integration services appear to have taken hold. Not only is the company delivering a more focused message relating to its Internet plans, but it's also executing efficiently, lauded users and analysts.

"HP, over the last year, has solidified their e-commerce strategy and communicated it well," said David Krauthamer, information systems director at Advanced Fibre Communi-

HP, page 16

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Unattended Remote Disaster Recovery	✓		
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High-Speed Image Backup	✓		
Free RAID Fault Tolerance	✓		
Shared Tape Library Support (ACSLS)	✓	✓	
Fibre Channel SAN Solution for Windows NT and NetWare	✓		✓
Unicenter TNG® Integration	✓	✓	
AS/400 Client Agent	✓		
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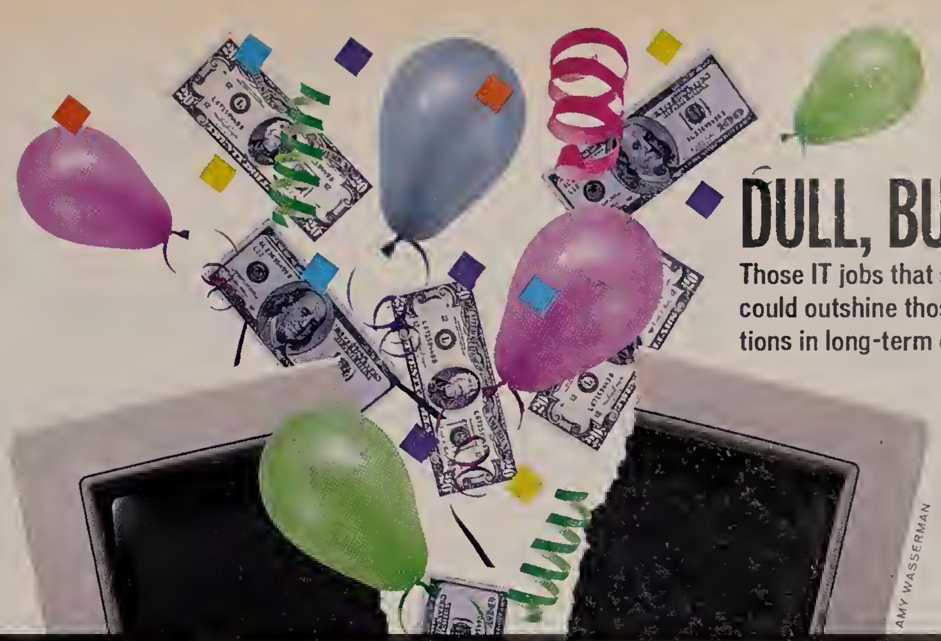
PHOTO OPPORTUNITY

Digital cameras priced at the $1,000 mark offer much better resolution than previous versions, our review shows. Page 67

Nikon
DIGITAL CAMERA COOLPIX 950
ZOOM NIKKOR


AMY WASSERMAN

DULL, BUT GOOD

Those IT jobs that seem pedestrian and dull could outshine those sexy and trendy positions in long-term career growth. Page 52

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AUGUST 16, 1999

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> “NOT HAVING A MARKET FOR FIVE DAYS IS UNACCEPTABLE.”
>
> KATHERINE SPRING, CHICAGO BOARD OF TRADE, ON AN MCI NETWORK OUTAGE THAT STOPPED REMOTE AND OVERNIGHT TRADING. SEE PAGE 1.

AT DEADLINE

FCC Nixes Cable Case

Federal Communications Commission Chairman William Kennard last week declined to investigate whether cable companies are unfairly limiting customer choice for Internet providers. Kennard said intervention would slow development of broadband networks. The FCC's Local and State Government Advisory Committee had recommended a probe.

Bank One Expands Outsourcing Pact

Bank One Corp. in Columbus, Ohio, has extended its outsourcing agreements with AT&T Solutions and IBM Global Services to include locations of First Chicago NBD Corp., which it acquired for $21 billion last October. AT&T got a new $465 million contract to unify the bank's data and voice networking infrastructure. IBM got a $168 million pact to manage the data center, mainframe and midrange servers for First Chicago.

Tupperware Sells Online

Tupperware Corp. in Orlando, Fla., known for its legions of independent field representatives and neighborhood parties, will also sell its food storage containers online by year's end at *www.tupperware.com*.

Y2K Stops Power For U.K. Customers

Thousands of London residents lost power for days earlier this month after the city's top utility distributed faulty smart cards designed to be year 2000-ready. London Electricity (*www.london-electricity.co.uk*), said roughly 2,000 of its PowerKey customers lost electricity after they tried to use new prepaid smart cards designed to pay for electricity as customers use it.

Short Takes

LUCENT TECHNOLOGIES INC. in Murray Hill, N.J., announced plans to buy Acton, Mass.-based virtual private network hardware provider **XEDIA CORP.** Xedia's customers include **UUNET TECHNOLOGIES INC.**, **PSINET INC.**, **CONCENTRIC NETWORKS** and **SPRINT CORP.**

Compaq Tries To Jump-Start Enterprise With 8-Way Server

Tandem-based technology a primer for telecommunications firms

BY STACY COLLETT AND JAIKUMAR VIJAYAN

When Compaq Computer Corp. unveils its eight-way Pentium III Xeon servers Tuesday in New York, it won't just be getting ahead of the server pack. The servers will be a centerpiece to a new business strategy.

Server group vice president Enrico Pesatori is expected to announce a new enterprise strategy outlining specific road maps for Compaq's own technologies as well as those it acquired from Digital Equipment Corp. and Tandem Computers Inc.

The strategy will include the setting up of a business-critical server group focused on delivering highly available systems based on Tandem technology.

The group will be headed by Bill Heil, vice president of Compaq's Tandem division, according to Terry Shannon, editor of "Shannon Knows Compaq," a newsletter in Ashland, Mass.

Market Strategy

The new eight-way servers are expected to form the basis of future Integrity XC clusters from the company. Integrity XC is a packaged, two- to six-node system comprising Compaq's ProLiant servers, The Santa Cruz Operation Inc.'s UnixWare operating system and Tandem's NonStop Clusters software. The technology — which Compaq has targeted mainly at telecommunications companies — allows users to tie multiple ProLiant systems in a high-availability cluster.

With the release of the new servers, Compaq is expected to make the technology available to Internet service providers and application hosting services.

Cheryl Currid, president of research firm Currid & Co. in Houston, said Compaq is finally ready to put the technology pieces of Digital and Tandem into play. "Digital bought a service organization that really knows how to keep [systems running] 24/7. They can fix a lot of short-term problems with scalability" for customers, she said.

An analyst who was briefed said nonstop electronic business would be a logical choice for Compaq and its high-availability experience. "The service provider has to have a low probability of in-service failure," and Compaq can deliver that, he said.

Dell Computer Corp. and IBM will make their eight-way server announcements in late August after Intel Corp. officially releases its long-awaited Profusion chip set. ◗

Sharon Gaudin contributed to this story.

IBM Global E-Ticket Plan Doesn't Excite U.S. Carriers

Big airlines plan own systems, alliances

BY STACY COLLETT

If passengers travel from New York to Paris to Morocco, chances are they're flying on two, maybe three different airlines. And forget about having their tickets issued electronically. In most cases, electronic-ticketing systems don't interact among airlines.

So for interairline travel, which represents some 30% of all bookings, paper tickets are the rule. IBM and the International Air Transport Association (IATA), a global industry group representing 266 airlines, want to change that.

The two are working to develop a global, Web-based service that will link the electronic-ticketing systems of hundreds of airlines around the world. The service, which will be available by mid-2000, will charge airlines for each transaction.

Having one link to a standard electronic-ticketing system can save millions of dollars on information technology development, testing and maintenance, said Claude Guay, a global marketing executive for IBM's global travel and transport group.

But so far, the idea hasn't taken off with some major U.S. airlines, many of which developed electronic-ticketing technology long before IBM.

Finding the Right Fit

American Airlines in Fort Worth, Texas, doesn't anticipate using the service, according to spokesman Tim Smith. American developed its own mainframe electronic-ticketing system with the Sabre Group, based in Forth Worth, Texas, which links it with alliance member Canadian Airlines Corp. American plans to link e-ticketing with United Air Lines Inc., British Airways PLC and Quantas next year. "We're further along with the technology than [IBM and IATA] at this point," said Smith, who expects three electronic-ticketing networks to emerge: American's, United Air Lines' Star alliance and IBM's.

United Air Lines in Chicago and Delta Air Lines in Atlanta say they're studying the IBM offering.

Northwest Airlines Inc. in Minneapolis doesn't plan to sign up, either. "We can't envision throwing our proprietary e-ticket information into one place or template," spokeswoman Marta Laughlin said. "The concept is really for smaller carriers."

Raymond Neidl, an airline analyst at ING Barings LLC in New York, said those airlines could still benefit from IBM's service. "People are going to want to travel outside the alliance, and if somebody develops that [global] system, it will be a superior system" over alliance systems, he said. U.S. airlines today issue less than 50% of their tickets issued electronically, he added.

IBM has developed e-ticketing technology for British Airways, Air New Zealand and Alitalia and will use similar technology to develop an electronic-ticketing standard.

IBM's central e-ticketing exchange is a mainframe set up in one of the company's global services facilities running an electronic-ticketing application on IBM's Transaction Processing Facility high-volume operating system. That system is already used by many airline and hospitality industry reservation systems. When airlines want to connect electronic-ticketing systems, they usually have to customize a communication system between their own reservation system and that of all their connected partners, Guay said.

For airlines that don't have electronic-ticketing capabilities, IBM will provide hosting services. Only 30 of IATA's 266-member airlines offer electronic-ticketing today, said spokeswoman Martine Malka in Montreal. ◗

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McDonald's Tests Food-Ordering Kiosks

Customers, technology may finally be ready for point-of-sale devices

BY STACY COLLETT

PLACING your own order on a computer at your favorite fast-food restaurant may seem like an obvious idea. But for several of the biggest chains, it's been a series of trials and errors. First, it was the text-based systems that led to too many wrong orders, then there was customer reluctance to use the systems. And the customer had to go to the counter to pay for the order anyway.

Now McDonald's Corp. thinks the moon and stars have aligned and is testing picture-based ordering kiosks near its Oakbrook Terrace, Ill., headquarters and in Wyoming, Mich.

Paul Knight, president of InfoAmerica Inc., the Fort Collins, Colo., company that developed the point-of-sale devices, said the machines are simple touch-screen, Windows 95-based PCs. But the transaction-processing feature, which lets you pay for your order at the PC, is what's making fast-food operators take notice.

Customers are also more at ease with computers now, said Dennis Lombardi, executive vice president at Technomic Inc., a food service consulting firm in Chicago. "It's a combination of the technology in handling cash transactions automatically and the general public's acceptance and willingness to do that," he said.

Burger King Corp. in Miami tried text-based kiosks 10 years ago, according to spokesman Charles Nicolas. "While the customers were somewhat receptive to it, the orders were sometimes wrong and it was slow service. But that's not to say we won't try it in the future," he said.

How quickly the kiosks pay for themselves and how much maintenance is needed will determine how popular they become, Lombardi said.

InfoAmerica also developed experimental kiosks for Taco Bell, but those machines didn't have the transaction feature, and the company decided not to use them, Knight said.

Lombardi said he expects the kiosks to end up in areas where people feel more comfortable with automation, like college campuses. ◗

Fast-Food Self-Service Hits and Misses

FRANCHISE	PLAN	RESULT
Burger King	Tested text-based kiosks in late 1980s	Wrong orders, slow service
Taco Bell	Tested kiosks without transaction feature in early 1990s	Transmitted orders faster than they could be filled
McDonald's	Testing picture-based kiosks with transaction processing	To be determined

Microsoft Installing Novell's Client Software in Win 2000

Link is reportedly tighter than MS NetWare client

BY SHARON GAUDIN

Microsoft Corp. reportedly is planning to include client software from Novell Inc. with its upcoming Windows 2000 Professional operating system. Industry observers said the Novell client software provides tighter links to NetWare servers than Microsoft's own version of the NetWare client, which it has shipped with Windows for years.

Microsoft has not previously included Novell's own client software.

"This is Microsoft admitting that companies that run NT also run NetWare," one source said. "Companies have been able to make that link, but this just makes it easier."

Novell Client for Windows 2000 will ship as part of Windows 2000 Professional, which is for desktops and is expected to ship with the Windows 2000 server as well, according to a source close to Novell.

Novell Client for Windows 2000, sometimes referred to as Client 32, is a set of protocols that enable NT or Windows 2000 desktops to access NetWare servers. Microsoft officials declined to comment on the product. ◗

Encryption Standard Finals

BY ANN HARRISON

Five encryption algorithms have been chosen as possible successors to the weak 56-bit Data Encryption Standard, which has been widely used by businesses and the U.S. government since 1977.

The U.S. Department of Commerce's National Institute of Standards and Technology (NIST) sponsored a competition to choose the next-generation advanced encryption standard. Encryption algorithms from IBM, RSA Laboratories in Bedford, Mass., and three teams of cryptographers from Belgium, the U.S., the U.K., Israel and Norway were selected as finalists.

NIST said in a statement that cryptographers who tested the algorithms on everything from large computers to smart cards found that the five selected proposals didn't contain security vulnerabilities.

NIST will accept further public scrutiny and analysis until May. ◗

E-Citi Banking on Wireless

Part of bid to snare a billion customers

BY THOMAS HOFFMAN

As part of its bold plans to increase its customer base tenfold, to 1 billion clients by 2012, Citigroup Inc. last week launched a project aimed at delivering wireless banking applications to customers by year's end.

The project, led by the bank's e-Citi unit, is geared to help the bank's global customers pay bills, trade stocks and access their accounts using mobile phones, smart phones, personal digital assistants and digital television.

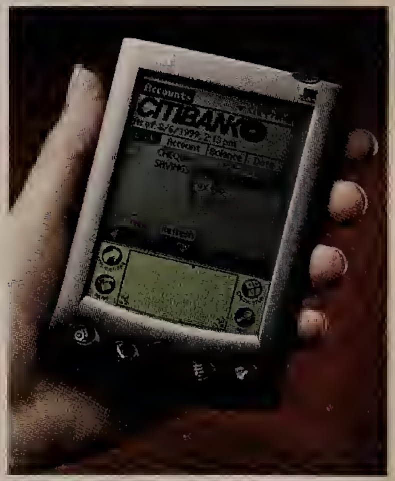
Citigroup rolled out mobile phone-based banking services to customers in Singapore and Hong Kong earlier this year. But to use the services of Citibank, Citigroup's consumer banking operation, customers in those regions must use a specific mobile phone service. The added project is aimed at allowing customers "to manage their finances using any device from anywhere at anytime," said Alan Young, a vice president at e-Citi in New York.

To make that possible, e-Citi has partnered with 724 Solutions Inc., a Toronto-based vendor whose software was designed to connect any device to any mobile network. To secure those transactions, e-Citi has tapped Sonera SmartTrust, a Helsinki, Finland-based mobile communications vendor.

E-Citi is expected to roll out its first wireless banking applications in Asia sometime in the fourth quarter, Young said. The bank plans to deliver wireless stock trading and bill payment applications sometime next year, he added.

Young declined to quantify e-Citi's investment in the wireless banking project. However, he said it costs less than building new branches and call centers and adding automated teller machines.

Citibank isn't the first financial services firm to jump into the wireless banking fray — nor will it have an easy time of making the project work, analysts said. Other banks piloting wireless banking applications include BankAmerica Corp. in Charlotte, N.C., Dresdner Bank AG in Frankfurt and Barclays PLC in London, said Octavio Marenzi, research director at Meridien Research Inc. in Newton, Mass.



PERSONAL DIGITAL ASSISTANTS will enable Citibank customers to trade stocks online

Another hurdle for Citigroup: Most of the mobile phones used in the U.S. are analog-based, which means they can't accept or transmit text-based messages, Marenzi noted. Plus, it will be a "big challenge" for Citigroup to process wireless transactions, because each of its country offices has a different back-office environment, said Bill Bradway, also a Meridien analyst.

Young conceded that the financial services giant faces some significant scaling issues. "It's easy to throw one baseball, but it's not easy to throw a billion baseballs," he said. ◗

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BRIEFS

Clinton Sets Up Net Crime Task Force

President Clinton has ordered the establishment of a working group to inspect unlawful conduct on the Internet, according to a statement from the White House. To be organized in the next 120 days, the group will include the attorney general, the chairman of the Federal Trade Commission and the FBI director. They will look into the effectiveness of current online laws and investigative techniques.

Y2K Summit Called For Chemical Industry

Automated systems at chemical companies "may fail in unpredictable and potentially dangerous ways" when year 2000 arrives, two U.S. senators said last week in a statement calling for an industry summit. A recent survey by the Chemical Manufacturers Association found that 30% of the nation's largest chemical companies still haven't declared their Y2K readiness, said Sens. Robert F. Bennett (R-Utah) and Christopher Dodd (D-Conn.).

New eBay President To Tackle Outages

Online auctioneer eBay Inc. has hired Maynard Webb, former CIO at Gateway, as president of eBay Technologies in a bid to help end a series of high-profile service outages that have already caused millions of dollars in lost business for eBay. In his new role, Webb – who spearheaded Gateway's e-commerce business – will oversee all engineering and technical operations at eBay.

Scholarships Offered For Tech Degrees

Pennsylvania is trying to solve the high-tech labor problem by offering college students up to $3,000 per year for three years to major in a science or technology area. Scholarship recipients must agree to work with a Pennsylvania company for up to three years after graduation or pay the state back.

Satellite Date Change Has Users on Guard

GPS clocks to reset for first time since launch

BY PATRICK THIBODEAU
WASHINGTON

FOR THE 24 satellites that make up the Global Positioning System (GPS), the "new year" is arriving next weekend. The internal clocks in those satellites will reset for the first time since the government started launching them in 1978. And that's prompting users to take precautions, ranging from GPS system shutdowns to simply warning employees to be ready for potential problems.

The GPS rollover has been likened to the year 2000 problem. On Jan. 5 to 6, 1980, when the system went live, GPS satellites began counting weeks from zero to 1,023. On Aug. 21, the satellite clocks will reset, or "rollover," to zero and start another two-decade count. Federal officials said the government-owned satellite system will keep sending out position and timing data past the rollover date without a hitch. But GPS systems that don't recognize the rollover could fail. GPS systems are well known for providing location information, but they also send out very precise time information used for timing computer networks.

GPS receivers can usually be repaired or replaced quickly, experts said. But users are still being cautious.

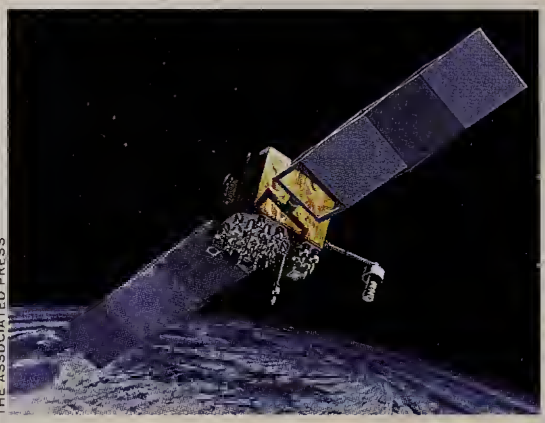
J. B. Hunt Transport Inc., for example, is shutting down the GPS-based systems it uses in about half of its 8,500 trucks on Aug. 18 and won't restart them until sometime after the date rollover, said George Brooks, vice president of research and development at the Lowell, Ark., company.

The GPS systems in the trucks are integrated into the company's back-end systems, and Brooks said he's worried that GPS problems could affect those systems. The satellite data is used to track vehicles, assign orders and optimize the use of the fleet. During the shutdown, the company will rely on a backup satellite-tracking system from Qualcomm Inc. in San Diego, which is also installed in Hunt's trucks, Brooks said.

In Delaware, state officials have notified state police and other users of its GPS-based radio transmission system to be aware of the potential for problems, said Richard Reynolds, the state project manager for the radio system.

The state has 10 800-MHz transmitters that use timing data from GPS satellites to synchronize the passing of radio transmissions. The vendor, Motorola Inc., had to upgrade the GPS receivers on the 3-year-old system to make them compliant. If the GPS system fails, radio transmission range will be limited, Reynolds said.

Some experts aren't worried. "I think everything is going to be fine," said Peter Dana, an independent consultant in Georgetown, Texas. "This is an issue that has been responsibly handled in my view by most of the industry." ◗


THE ASSOCIATED PRESS

THE GPS system's clocks will roll over Aug. 21

No News Is Good News for Pan Am Games' IT Team

Hastily installed net monitor hums

BY SAMI LAIS

The network at the Pan American Games, which opened last month in Winnipeg, Manitoba, made no news. Scores, times and graphics streamed in real time to scoreboards, judges and local audiences, then to a centralized results system for broadcast to news outlets, remote audiences and the Games' Web site.

Quite an accomplishment, considering that the network's monitoring system wasn't even begun until the Games were less than two weeks away. The Winnipeg Convention Center information technology team in January started the network for the continent's third-largest sports competition ever, which sprawled over 42 sites that were as much as 180 miles apart.

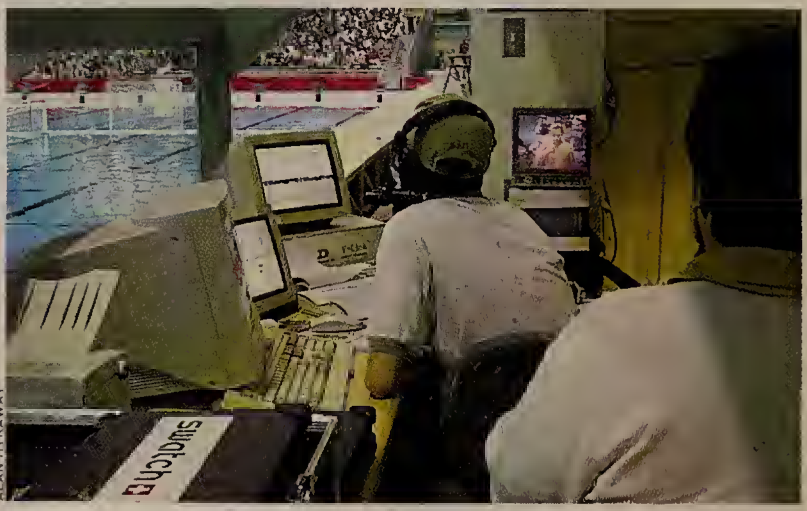
In early July, the event's IT consultants blanched upon realizing there was no comprehensive network monitoring system, said Clifford Durston, the Games' vice president of technology. How did the oversight go so long before being caught? "We had monitoring established from router to router," Durston said, but no networkwide monitoring.

When the Games opened July 22, network monitoring was in place. Each of 736 devices on the multivendor network was monitored by the Kinnetics Enterprise Network Manager from Loran Technologies Inc. in Vienna, Va. Kinnetics monitoring software comes on a Linux-powered server that plugs in to the network, automatically discovers devices and displays them in a graphical map that uses different icons for different types of devices.

An "autodiscovery" system is standard for such tools, but some, like Hewlett-Packard Co.'s OpenView Network Node Manager, for example, show "just generic images, and you have to go out and manually" discover statistics on devices, said Irwin Lazar, an analyst at consulting firm Net Reference in Sterling, Va.

Because of the late date and the hodgepodge network, Kinnetics' plug-and-play aspect was key. Organizers needed "something that would let us know immediately if there was a problem so we could quickly swap it out," said Alan Hykaway, the Games' systems manager. With some of the products the IT team considered, he said, "by the time we could configure them, the event would be over."

Built-in diagnostics require no event filter programming or network description. Kinnetics uses selective polling for real-time monitoring. The point-and-click graphical user interface demanded a skill level lower than similar products such as OpenView, said Jerry Kube, venue IT systems coordinator for the Games. ◗



ALAN HYKAWAY

PLUG-AND-PLAY was key to the success of the Games' system

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Inside information:
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Document Management Vendors Move Into Outsourcing

BY DOMINIQUE DECKMYN

With application outsourcing on the rise for everything from e-mail to enterprise resource planning, document management vendors are starting to look at application service providers as a way to tempt new customers. But analysts and users are doubtful.

Documentum Inc. in Pleasanton, Calif., announced last week that it was joining the recently formed Application Service Provider International Forum and would work with providers to offer hosted versions of its Enterprise Document Management System software.

Separately, San Francisco-based Document Repository Inc. launched a hosted document management offering for the legal profession. The service, called CaseCentral.com, is aimed at managing the millions of documents involved in big litigation cases and is priced at 0.4 cents per document per month.

Karren Baker, an attorney at San Francisco law firm Sinnott, Dito, Moura & Puebla, is using CaseCentral.com in several major insurance coverage cases. "It doesn't make sense to acquire hardware for one particular case," Baker said.

Reaching New Customers

Andrew Warzecha, an analyst at Stamford, Conn.-based Meta Group Inc., said the application service provider model may help high-end document management companies such as Documentum and Costa Mesa, Calif.-based FileNet Corp. reach small or medium-size businesses that would otherwise opt for low-end products from vendors such as Xerox Corp. or Eastman Software Inc. in Billerica, Mass. But Warzecha said document management may often be hard to outsource because of great differences in how companies use documents.

A key Documentum competitor, Open Text Corp. in Waterloo, Ontario, has built its own hosting infrastructure and started offering a hosted version of its Livelink software in early 1998. But the company hasn't marketed its service widely and has only nine customers for it. FileNet is working with a partner, Dallas-based Affiliated Computer Services Inc., to offer an outsourced version of its software.

Ron Scott, a systems superintendent at polyester manufacturer Wellman Inc. in Bay St. Louis, Miss., is cautious, however. "In a chemical plant, we're dependent on quick access to [technical] documents," he said. "I don't want to be dependent on a point of failure I can't control." ▶

MOREONLINE

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Final Arguments Released, Judge's Opinion Next on Tap

Government focuses on consumer harm; Redmond highlights changing market

BY PATRICK THIBODEAU
WASHINGTON

Both sides in the Microsoft Corp. antitrust trial last week summed up their respective cases in two voluminous briefs for trial Judge Thomas Penfield Jackson. The briefs are the last shot each side has to make its best arguments in the case.

The government and Microsoft will return to court Sept. 22 to make closing arguments. But the oral arguments will be a mere digest of the "findings of fact" filed last week.

It's now up to Jackson to issue an opinion regarding the facts in the case, and he's expected to do that before year's end. That opinion will be separate from a final verdict. What the judge will do, legal experts said, is write an opinion essentially stating which set of facts he agrees with the most.

The unusual procedure was established by Jackson to separate the facts proven at the trial from the conclusions of law.

"Once he rules on the facts, inevitably he shows his cards on the law," said Hillard Sterling, an attorney at Gordon & Glickson PC in Chicago. Jackson's purpose in this two-step decision-making process may be "to coerce a settlement by revealing his leanings."

The government's findings restate the major charges made in opening arguments on Oct. 19 last year. But the findings are very focused on the issue of consumer harm — an area legal experts have said is among the most difficult to prove.

MICROSOFT VS. DOJ

Microsoft's attorneys tried to turn the spotlight on the rapidly changing marketplace to debunk the government's claim that it has such a well-entrenched monopoly on Intel Corp.-based PC operating systems that government intervention is required.

The company's strongest argument of fact may be that Netscape Communications Corp. — the Internet browser developer that the government alleges Microsoft tried to quash — was worth billions of dollars to a Microsoft rival, America Online Inc. AOL announced its purchase of Netscape last November.

Not surprisingly, Microsoft and the U.S. Department of Justice have used the same testimony and evidence to offer entirely different conclusions.

For instance, from the government's point of view, The Boeing Co. was harmed by Microsoft's decision to integrate Internet Explorer with the Windows operating system. Citing written testimony by Boeing executive Scott Vesey, the government said Explorer lacked cross-platform capabilities and posed security risks.

But Microsoft pointed out that Vesey also testified that Explorer's features were beneficial and could be used by corporate customers "in an imaginative and useful way."

Also, according to Microsoft, the government's own chief economics witness testified that consumers hadn't been harmed to date, when first asked that question at trial. The witness, Franklin Fisher, an economist at MIT, testified differently when he appeared as a rebuttal witness several months later. He said at that time that consumers had been harmed by elimination of choice. Microsoft discounted his testimony as speculation and of no evidentiary value.

But the government said Fisher also warned that if Microsoft is unchecked, "we will live, as it were, in a Microsoft world in which choices are the choices that Microsoft makes."

Another issue that may affect the judge's decision could be a verdict in the Microsoft/Sun Microsystems Inc. Java licensing case. In that case, U.S. District Court Judge Ronald Whyte has issued opinions suggesting that "Microsoft was trying to balkanize Java," said Rich Gray, an attorney at Bergeson, Eliopoulos, Grady & Gray LLP in San Jose.

Gray said he believes that the Bristol Technology Inc. antitrust case, which Microsoft recently won, was too narrow to affect the Justice Department's case. ◗

Industry Standard Washington bureau chief Elizabeth Wasserman contributed to this article.

AT A GLANCE

Dueling Briefs

Government arguments:

- "Microsoft's illegal maintenance of its monopoly has already deprived consumers of the potential benefits of greater choice, more innovation and lower prices for Windows . . ."
- "Microsoft can be expected to continue to use its power over operating systems . . . to innovate and affect innovation to preserve its operating system monopoly."

www.microsoft.com/presspass/trial/fof

Microsoft arguments

- "Permitting AOL/Netscape, Apple, IBM and Sun to breathe easier would do nothing to help – and would likely hurt – consumers."
- ". . . the world is changing very quickly, and the changes that are taking place are inconsistent with the notion that Microsoft possesses durable monopoly power . . ."

www.usdoj.gov/atr/

FTC May Send Intel Back to Woodshed

The U.S. Federal Trade Commission last week voted to finalize its antitrust settlement with Intel Corp. But the decision was probably cold comfort to the company, which still faces an FTC investigation into business practices not covered in the settlement.

"We continue to cooperate with them," Intel spokesman Chuck Mulloy said of the FTC's ongoing action. "We continue to believe that by the time they complete their investigation, they will conclude that our business practices are fair and lawful."

In its antitrust action, the FTC said Intel had used its market power to force several firms to enter into agreements with terms that were favorable to the chip making giant. The companies involved were Digital Equipment Corp., Compaq Computer Corp. and Intergraph Corp. The settlement puts restrictions on Intel's ability to do that in the future.

The commission voted 3-1 to settle the case, with Commissioner Orson Swindle opposed. "I continued to lack reason to believe that Intel's actions . . . would have adversely affected competition and innovation," he said, according to minutes of the meeting.

FTC officials wouldn't comment on the ongoing Intel investigation.

– Patrick Thibodeau

Users to Wait and See on Embedded NT 4.0

BY SHARON GAUDIN

Microsoft Corp. has shipped its Windows NT Embedded 4.0 operating system to third-party vendors. And corporate users are waiting to see if it's lightweight enough to turn their copiers and printers into smart machines and not choke them with complex coding.

"If having NT in our copiers and fax machines would help my users manage their jobs and productivity from their desktops, that would be tremendous," said Todd Richter, a PC specialist at Baystate Health Systems in Springfield, Mass.

NT Embedded 4.0, which runs on 12M bytes of RAM, is a leaner version of NT 4.0 and was designed to run in relatively small devices, like fax machines, medical monitors and manufacturing machines, which normally can handle that memory demand easily.

As it stands now, few office machines have the built-in intelligence that would allow them to communicate with other machines like postage meters or inventory scanners.

"It's not like Microsoft has taken NT and shrunken it," said Matt Nordan, an analyst at Forrester Research Inc. in Cambridge, Mass. "They've simply left out the parts users won't need for this type of work."

A Microsoft spokesman said he expects third-party vendors such as Hewlett-Packard Co. and Lucent Technologies Inc. to turn out NT-enabled products by early next year. Specific products haven't been announced.

Microsoft's last such effort — Microsoft at Work, an embedded operating system for office equipment — went nowhere in 1993.

Novell Inc., a frequent Microsoft rival, also tried its hand in the embedded market with the Novell Embedded Systems Technology, a lightweight operating system designed to run in small to midsize appliances. Novell dropped the effort when the company hit rough financial waters. Intelogis, a Draper, Utah,-based vendor, bought the technology and is trying to develop it.

Industry watchers said it's difficult to push a new operating system that has to be compliant with software running on desktops and servers.

Nordan said that though tiny operating systems are embedded in everything from automobiles to security systems, to create a popular multidevice operating system, it helps to have a good strong base — like NT's — to build on. ◗

JUST THE FACTS

Embedded NT

- **Version 4.0 shipped last week**
- **Geared for copiers, medical equipment, fax machines and manufacturing equipment**
- **Based on Windows NT 4.0 code**
- **Trimmed down to 12M bytes of RAM**

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STAY LONG ENOUGH AND WE'LL SHOW YOU HOW TO BUILD ONE.

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2: Desktop or laptop?
Hardware: Do it yourself
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BRIEFS

AOL, Novell Join On Instant Messaging

America Online Inc.'s AOL Instant Messenger software will be integrated with Novell Directory Service and Novell Inc.'s GroupWise messaging server, creating an instant messaging offering for the enterprise, both companies announced last week. The deal strengthens AOL's position in its struggle with Microsoft Corp. over control of the instant messaging market.

IBM Adds to Linux Services

IBM's Global Services unit said it will provide a full portfolio of services for Linux, including Web and database server implementations, infrastructure design and network design. Meanwhile, Lotus Development Corp. said it's making a pre-beta version of Domino for Linux available for free download.

DOD Alters Passwords

The U.S. Department of Defense this month ordered all user and administrative passwords on unclassified networks changed. The order was part of a "routine measure" to ensure that the password process takes place, a spokeswoman said.

Catalog Company's Internet Sales Soar

Lands' End Inc. reported its Internet sales for the quarter ended July 30 were about 2.5 times greater than those of a year ago. The Dodgeville, Wis., catalog retailer didn't disclose specific sales numbers but said Net sales were $61 million for fiscal 1998 – about 4.5% of total sales.

CA, Taiwanese Firm Form GPS Company

Computer Associates International Inc. and a Taiwanese chip maker have formed a New York-based joint venture to develop "location-aware" applications that can notify owners of delays and other time- and location-dependent data on trucks or other objects being tracked.

Linux Web Server Clusters Emerge

Products introduce high-availability features at comparatively low cost

BY DAVID ORENSTEIN
SAN JOSE

LINUX USERS who clustered at certain Linux World Conference & Expo booths last week got a glimpse of the coming availability of high availability — via clustering — for the free Unix variant.

Clustering will make Linux Web servers more reliable, but even vendors acknowledged that Linux might need years to achieve the full clustering capabilities of its big Unix brothers. Linux lacks a journaling file system, which would help it recover from crashes. Also, it has no capability yet to allow midstream data transactions to survive a crash of a machine in a cluster.

"Solving the problem is at least three years out," said Greg Weiss, an analyst at D. H. Brown Associates Inc. in Port Chester, N.Y. Though the Linux community may take a while to grapple with the technology, he said, "there's no reason you can't do it. It's just software." Linux has supported the niche of clusters for scientific parallel computing, but corporate users more often use Linux to serve standard Web pages. For that purpose, users said, the current clustering technology might help.

Brisbane, Calif.-based TurboLinux Inc. is bringing high-availability cluster traits like load balancing and fail-over to basic Web serving, said Dan Birchall, a beta tester of the company's TurboCluster technology at Web hoster Digital Facilities Management Inc. in Haddonfield, N.J. Birchall implemented a cluster that he said has performed well and cost about $7,500 compared with a $75,000 commercial Unix cluster.

A prototype of a Linux Web serving cluster from SGI and clustering vendor Veritas Software Corp. in Mountain View, Calif., attracted the attention of Tony Ten Broeck, a Unix systems administrator at The Money Store Inc. in Sacramento, Calif. The vendors showed a prototype of a Linux Web serving cluster. Ten Broeck said the Linux system would be a viable choice for Web serving, but the company has a heavy investment in Solaris that it wouldn't likely abandon. To host data, the company uses Oracle Corp.'s Parallel Server, which isn't available on Linux.

Veritas, meanwhile, isn't sure whether it will release its clustering software for Linux because it's uncertain whether there's a big enough market among enterprise users, said product manager Steve Kenniston. However, one customer — Burlington Coat Factory Warehouse Inc. — has sought to encourage Veritas to do so, said Matt Farhner, the retailer's director of networking. ◗

A Cluster of Clustering

Three vendors demonstrated clustering technology for Linux servers at Linux World

VENDOR	PRODUCT	NOTES
TurboLinux Inc.	TurboCluster	Now available
VA Linux Systems	ClusterCity	Custom now; off-the-shelf version coming soon
SGI and Veritas	No name	Experimental only

Torvalds Offers Linux Road Map

New version keys in on multiprocessing

BY DAVID ORENSTEIN
SAN JOSE

Linux creator Linus Torvalds previewed the next two versions — 2.4 and 3.0 — of the free Unix variant's kernel last week at the Linux World Conference & Expo here.

Version 2.4 of the kernel, which will be finished by year's end, is far less ambitious than was the current Version 2.2 kernel, which added a lot of features to Linux but took more than two years to develop. Torvalds said Version 2.4 should refine the work that developers put into 2.2.

Version 2.4 will optimize Linux's nascent symmetric multiprocessing capabilities but won't necessarily increase the total number of processors a machine can use beyond the current eight, he said. Penguin Computing Inc. offers an eight-way Intel Xeon server. Meanwhile, one of the new features planned for Version 2.4 is support for Universal Serial Bus.

Version 3.0, which Torvalds said won't be done for at least a year, will grapple with enterprise availability and reliability issues like clustering and a journaling file system to help systems recover after crashes.

LINUX WORLD

It will also include support for Intel Corp.'s IA-64 processors.

In a meeting with reporters last week, Torvalds said he wants to see Linux's support for wireless and embedded technology take off. He is even putting a wireless network in his home. He plans to enhance Linux's support for mobile technologies such as power management and PC Card support. ◗

AltaVista: Free Net Access

Users must agree to view ads, supply data

BY JULIA KING

Internet access is now yours for the taking from AltaVista.

But don't look for other big Internet portals to follow suit any time soon. And don't look for corporate users to swoon over the service.

As expected, AltaVista Co. last week announced free Internet access to subscribers willing to view ads and provide information about themselves [Page 1, July 19].

Microportal

The portal also announced what it calls a free "microportal" service that gives users continual access to their own range of personalized Web sites through a window on their desktop, eliminating the need to repeatedly scroll through their bookmarks.

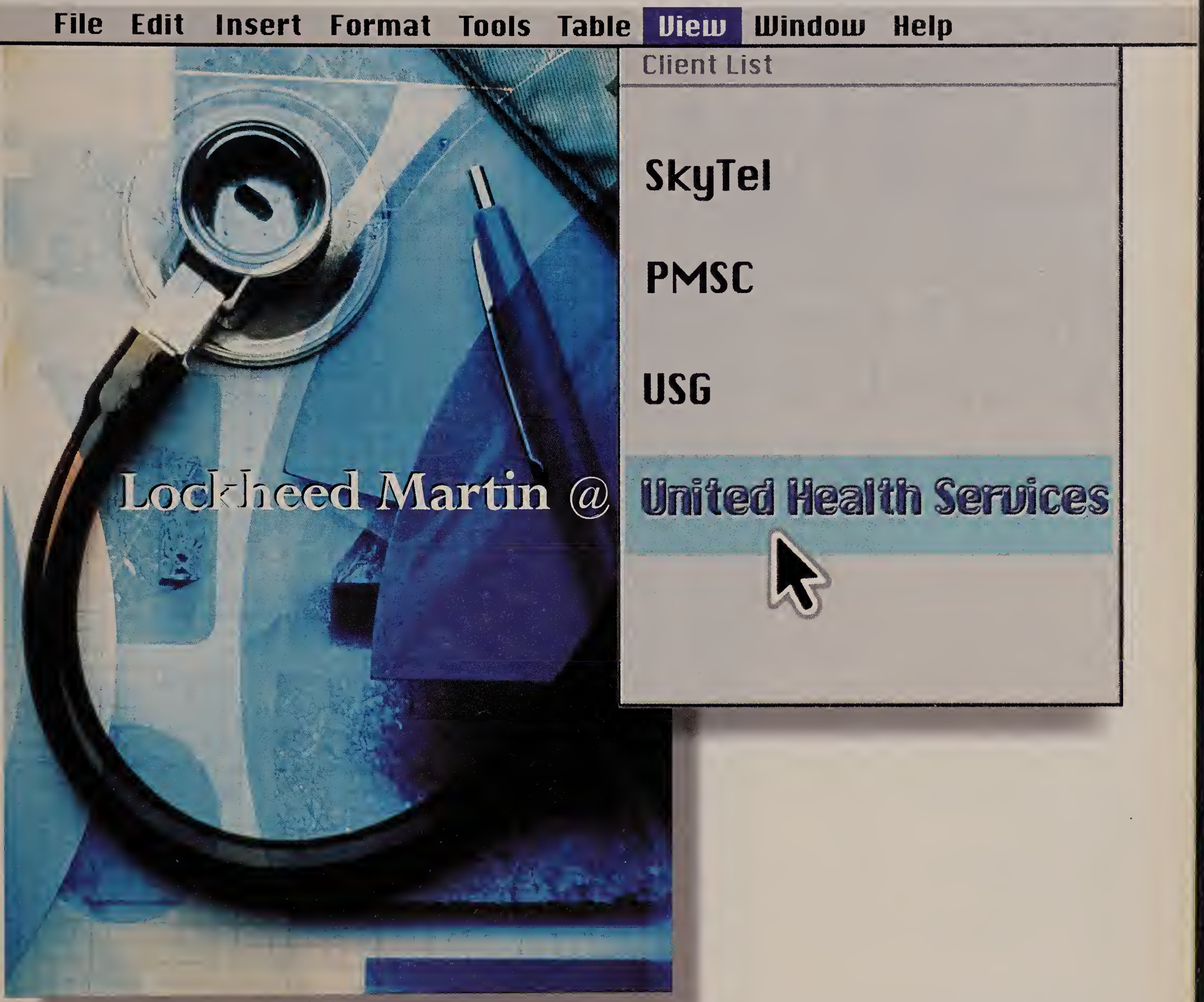
Yahoo Inc. and The Microsoft Network (MSN) last week said they have no immediate plans to offer free Internet access.

Microsoft will stick to its offer of $400 off any computer for MSN subscribers who sign up for three years at $19.95 per month. Yahoo offers users discounted Internet access through AT&T WorldNet Service at $14.95 per month.

"You're going to see other portal sites watch this for a few months and determine if AltaVista is gaining a lot of viewership," said Rick Miller, an analyst at Cahners In-Stat Group, a market research firm in Newton, Mass.

Miller said he expects primarily recreational Internet users to switch to the free service. "Business users won't risk that the service could go down with no guarantees," he said. ◗

MISSION: You're going home. At United Health Services, that sound of success is heard more quickly these days. How? A Lockheed Martin network that's turning paper systems into digital systems. The result: medical data that appears when it's needed, where it's needed: at bedside, in the lab, or viewed by physicians in several locations at once.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FREE KEVIN
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THE ASSOCIATED PRESS

SUPPORTERS OF CRACKER Kevin Mitnick gather outside the federal courthouse in Philadelphia June 4. Mitnick has admitted he broke in to the computers of several high-tech companies, stealing software and installing his own programs, causing more than $1 million in damage

Mitnick Gets 46-Month Term

Prosecutors had asked for $1.5M fine, got $4,125

BY ANN HARRISON

CONVICTED computer cracker Kevin Mitnick was sentenced last week to 46 months in prison and ordered to pay $4,125 in restitution to more than a dozen companies and organizations.

The damages, which Mitnick must pay during a three-year period of supervised release, are a fraction of the $1.5 million request made by federal prosecutors.

U.S. District Judge Marianne Pfaelzer acknowledged that the fine is a "token" amount but said she wanted to levy a fine that she was sure Mitnick could pay as a condition of his release. Mitnick is scheduled to be released to a halfway house in January, but he may be freed earlier if credited with time off for good behavior.

Ira Winkler, president of the Internet Security Advisor's Group in Saverna Park, Md., said the value of the damages Mitnick inflicted were closer to $1.5 million than $4,125. But he said the victims hurt their case by inflating damage estimates. "I wish the prosecution and the victims had much more realistic numbers than $80 million [in damages claimed by Mitnick's victims], which was absolutely ridiculous," Winkler said.

Under the terms of his release, Mitnick is barred from access to computer hardware and software and any form of wireless communications. He's also banned from working at a company that has computers, and he can't possess passwords, cellular phone codes or data encryption devices without permission.

Mitnick pleaded guilty earlier this year to seven counts of computer and wire fraud charges. He has been in jail since February 1995 for violating probation on an earlier conviction and fleeing from authorities.

California prosecutors have dropped remaining state changes against him.

Since his arrest in 1995 for cracking corporate and university systems and for illegally downloading proprietary software, Mitnick has been the subject of four books and an upcoming film.

A grassroots "Free Kevin" campaign decried Mitnick's long stint in jail without a trial. Jennifer Granick, a San Francisco defense attorney who represents people charged with computer crimes, said prosecutors used the case as a warning to would-be crackers. But she said she hopes prosecutors will now deal with such cases "in a much more sober and level-headed way." ◗

Continued from page 1

HP and Internet

cations Inc., a Petaluma, Calif.-based manufacturer of telecommunications equipment.

Wall Street has noticed. After the company last quarter nailed a $918 million profit on revenue of $12.4 billion, HP's stock price hit an all-time high of $118 last month. (Last week, the stock had dropped to $103).

But how long can the party last? HP's challenge now is to make sure its Internet focus doesn't hurt service and support in its core hardware business. "It feels to me like HP, in some areas, is squandering its reputation [with] its loyal customers in order to be competitive," said a systems administrator at an Internet service provider, who asked not to be named.

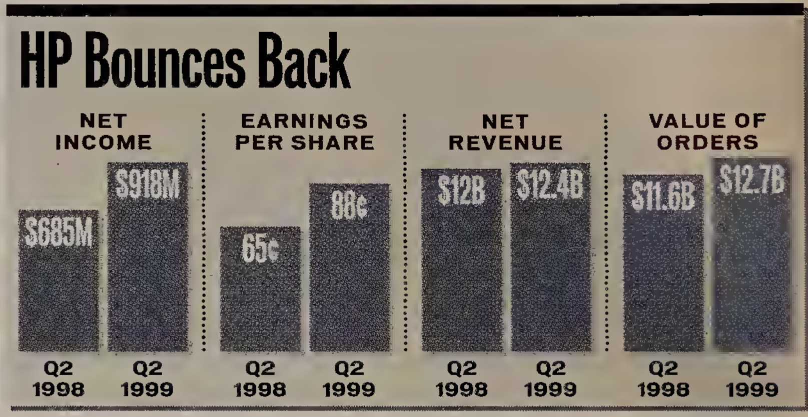
But most users are more upbeat. "I would give them an A+ for refocusing a large organization in a short period of time," said Chuck Pierecy, executive director of Interex, the 20,000-member user group that organizes HP World. Pierecy cited the naming of new CEO Carly Fiorina as a "prime example of how HP has been firing on all cylinders."

HP World '99 — which is expected to draw a record 12,000 attendees — will reflect much of the change. For the first time, the show will feature an electronic services summit, as well as an Internet service provider summit, and new sessions relating to enterprise resource planning and Linux.

Key to the growing attention around HP's Internet plans has been its decision to "change business models and take calculated risks rather than simply try and play catch-up with other vendors," said Laurie McCabe, an analyst at Summit Strategies Inc. in Boston.

One example is HP's willingness to partner with a wide range of companies to quickly deliver new Web capabilities it doesn't either have or want to build on its own. For example:

- Last week, HP announced a partnership with Yahoo Inc. in Santa Clara, Calif., under which it will help companies deploy customized portals for their employees (see story, page 20).
- HP is spending $150 million to develop a portal site for manufacturing companies, in alliance with Engineering Animation Inc. in Ames, Iowa.
- HP has changed its financing models to spur acceptance of its plans. Under its Commerce for the Millennium initiative, HP will give away e-commerce hardware and software in exchange for a cut of future revenue. ◗


HP Bounces Back

Sun-Netscape Enters Deal To Offer Outsourced E-Mail

BY DOMINIQUE DECKMYN

Analysts said a deal signed last week shows that the Sun-Netscape Alliance is becoming a key technology provider for users who want to outsource their e-mail networks.

Under the deal, Rochester, N.Y.-based network backbone provider Frontier Corp. will build an e-mail outsourcing service based on Sun Microsystems Inc.'s Internet Mail Server and Netscape Communications Corp.'s Directory Server.

The service will be available in the fourth quarter and will be able to support millions of simultaneous users, according to Frontier. Frontier will offer the service to Internet service providers and eventually to small and midsize businesses as well.

The deal came on the heels of a similar agreement with USA.net, a leading provider of hosted mailboxes. Early next year, as part of the same deal, Frontier will offer its customers calendaring and scheduling, also based on software from the Sun-Netscape Alliance.

"[Outsourced] e-mail by itself is not compelling to enterprises," said Marc Levitt, an analyst at International Data Corp. in Framingham, Mass. He said adding calendaring will make the service more attractive. Other vendors like Software.com are also rushing to add such services, Levitt said.

A recent study from Palo Alto, Calif.-based Radicati Group Inc. found that two out of three Global 1,000 corporations would consider outsourcing some or all of their messaging.

But analysts said most e-mail outsourcers provide merely hosted mailboxes, with little value-add, so they appeal mainly to consumers.

Servers such as Lotus Development Corp.'s Domino and Microsoft Corp.'s Exchange have yet to emerge as strong players among e-mail outsourcing providers.

The combination of Sun's proven Internet Mail Server and Netscape's collaboration software makes for an attractive offering to Internet service providers that want to offer such services, said Laura Ventura, director of market research at Radicati Group. ◗

JUST THE FACTS

Going Up

Outsourced messaging is on the rise:

- **66% of Global 1,000 companies would consider outsourcing messaging**
- **Managed messaging services are forecast to grow to $5.9B in revenue in 2003**

Base: Interviews with 54 IT executives at Global 1,000 companies

SOURCE: RADICATI GROUP INC., PALO ALTO, CALIF.

MOREONLINE

For resources on outsourcing and messaging, visit our Web site.
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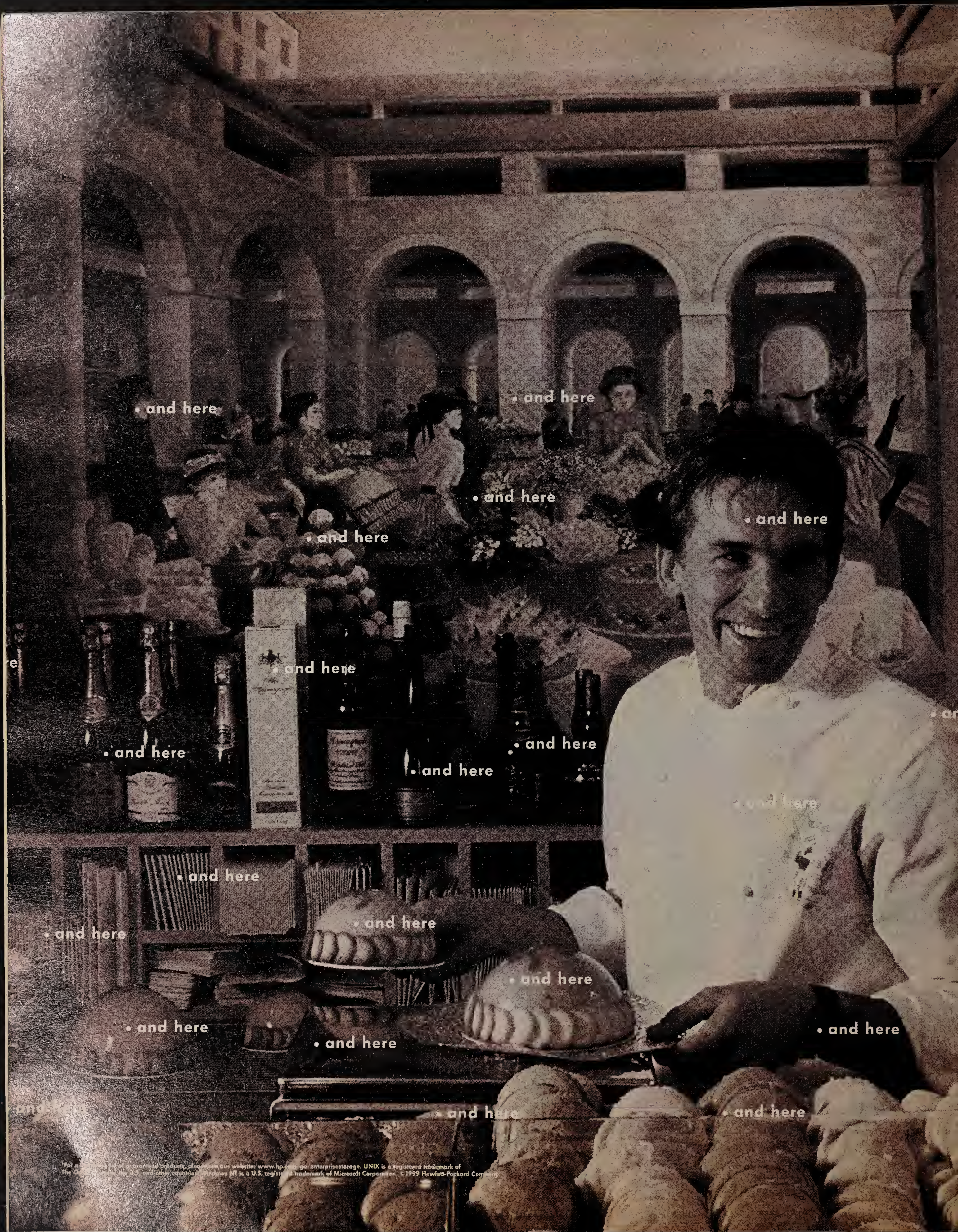
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Feds Seek To Close Cyberwarrior Gap

Potentially huge shortage of security specialists may leave U.S. vulnerable

BY PATRICK THIBODEAU
WASHINGTON

FEDERAL OFFICIALS are looking at ways to prevent an "electronic Pearl Harbor," or a sneak cyberattack on the U.S. But in a situation somewhat parallel to the plight of the undermanned and unprepared U.S. military in the 1930s, the federal government is facing a tremendous shortage of people needed to fight any future cyberwar.

During the next seven years, the government will have to replace more than 32,000 information technology workers — almost half the 71,000 IT workers employed by federal agencies, said a recent study by the federal Chief Information Officers Council. Much of the turnover is the result of a rise in the number of employees eligible for retirement.

The greatest need is for IT employees with information security skills, according to that report, which also urged the creation of a massive intrusion detection system to protect federal and critical private systems such as energy, telecommunications and transportation against cyberattacks.

Low salaries and incentives make it difficult for federal agencies to compete with the private sector. Government IT workers often start at less than $25,000 a year (compared with $36,000 in the private sector), and the federal security plan recommends improving pay. There's "fierce competition" for IT workers with security skills, said Timothy Grance, manager of systems and network security at the National Institute of Standards and Technology. But a pay-for-performance salary program and the promise of working on research projects have been hiring incentives, he said.

The national cyberprotection plan recommends funding information security programs at universities and offering scholarships to students in exchange for a commitment to work at federal agencies. Such programs may ultimately benefit private companies.

Only a few universities now offer programs in information security. "Security hasn't made it into the mainstream of academe," said Lance J. Hoffman, a professor of computer science at George Washington University in Washington.

MARC BERLOW

USA GROUP'S PAUL JANSEN: Most security specialists get their training on the job

On-the-Job Training

So most IT students study to become programmers or Windows NT experts, while security specialists tend to get their training on the job, said Paul Jansen, manager of information security at USA Group Inc., a 2,800-employee loan guarantor and administration company in Indianapolis. When he hires, "I'm hiring other companies' security people," he said.

If more universities offer security training, "I'm going to get people who have a better understanding of what our profession is all about," Jansen said.

Throughout the industry, firms are having a tough time hiring IT workers with security skills. "I consider the need dire," said Richard Power, editorial director at Computer Security Institute in San Francisco. ◗

Strings Attached To eCongo Web 'Freebie'

Fees attached to payments, reports, add-ons

BY JULIA KING

This week, Internet start-up eCongo Inc. claimed to offer the first complete set of free integrated e-commerce services that companies need to conduct business online. But only some of those services are 100% free.

For example, eCongo customers, such as Inside-Out Home and Garden, a retailer in Campbell, Calif., must pay a per-transaction fee for real-time processing of credit-card purchases (in addition to the fees that already go to the credit-card companies). They also pay extra for reports that analyze online advertising performance.

What users get at no charge is PC-based software to build a Web-based store, software for building ads, a set of standard e-mail messages that automatically notify customers about the status of their orders and around-the-clock Web site hosting at eCongo's data center. The fulfillment of orders or any integration with back-end systems is up to the user.

In addition to retailers, eCongo is also pitching its new managed e-commerce services to portals, banks and others that can give the services away or sell them under their own label.

Analysts characterized eCongo's offering as the latest in a string of Internet-based freebies designed to attract small businesses and consumers online.

In Good Company

America Online Inc.'s CompuServe service, the Microsoft Network and Prodigy Services Corp. are all offering a free PC or $400 off the price of one to consumers who sign on for three years of Internet service.

Last month, AltaVista Co. announced free Internet access for subscribers willing to view ads and provide information about themselves [News, July 19].

"This trend is the equivalent of the toy in the cereal box. The kid wants the toy more than the cereal, but you still make the sale," said Gene Alvarez, an analyst at Meta Group Inc. in Stamford, Conn.

Andy Bartels, an analyst at Giga Information Group Inc. in Cambridge, Mass., likens such offers to selling a car for which "you have to pay extra for the wheels and the steering wheel," he said.

But for users like John Ettema, owner of Inside-Out Home and Garden, eCongo was the fastest and cheapest way to get an online store (*insideout.econgo.com*) up and running.

"A lot of small businesses don't have cash laying around. Plus, most small businesspeople I know are really intimidated by technology. So when they came to me and said this is a free service, I was immediately interested," he said. ◗

Yahoo/HP Service Melds Net, Intranets

BY JAIKUMAR VIJAYAN

Hewlett-Packard Co. and Yahoo Inc. are teaming up to help corporations set up portals that will meld customized information and services from the Internet with corporate intranets.

The portals will provide corporate employees with a secure, single point of access to internal information — like customer records and order tracking — as well as external services such as customized financial news, stock tracking and travel reservations.

HP and Yahoo last week announced a new subscription-based service called Corporate My Yahoo, which combines Yahoo's interface with a number of HP Internet technologies, such as its e-speak portal services, behavior-based profiling and personalization technology.

The service will go into pilot testing in the last quarter and be generally available in the first quarter of next year.

More Effective

"The power comes from being able to take internal and external information and use it more effectively for things like business intelligence and marketing," said Laurie McCabe, an analyst at Summit Strategies Inc. in Boston. "Right now, the only way companies can do it is manually."

"With a simple Web browser, an employee tends to spend a lot of time tinkering around and sorting through relevant information," agreed Thomas Wilmott, president of Aberdeen Group Inc. in Boston. "So the idea of having a customized portal linking outside Internet e-services with the intranet is intriguing."

HP will provide the needed services for companies to integrate and deploy Corporate My Yahoo. For instance, HP will help them integrate things like internal product directories, training courses and proprietary data warehouse information on Corporate My Yahoo. ◗

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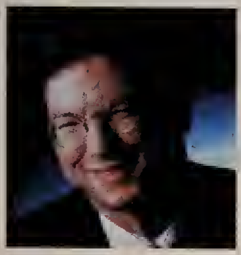

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Keynote—Dr. Eric Schmidt, Chairman of the Board and CEO, Novell, Inc.

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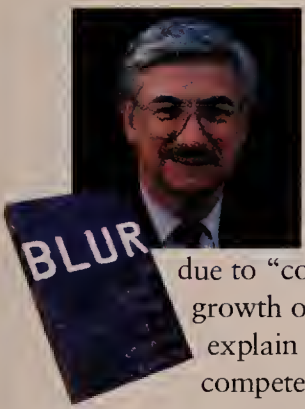

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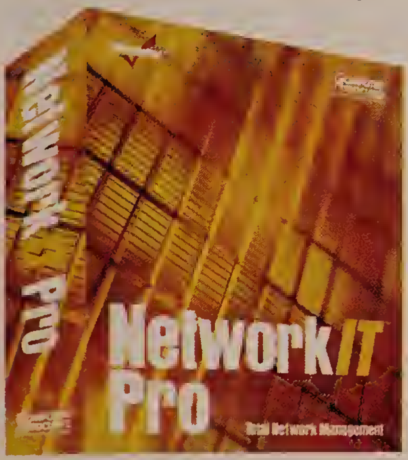

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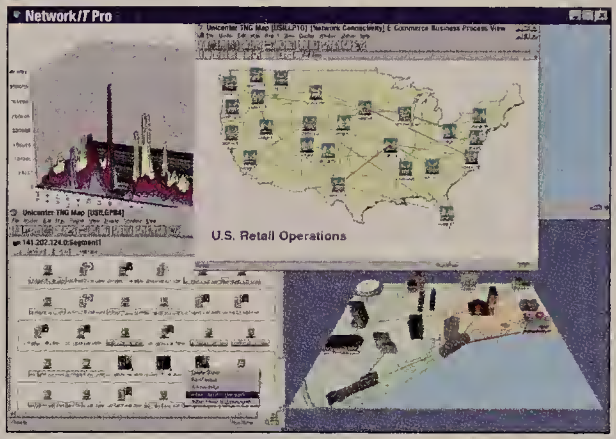

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Hackers, Consultants Embrace Secure Tool

Offers alternative to virtual private nets

BY ANN HARRISON
ALTLANDSBERG, GERMANY

When IT security consultants attend hacker conferences, they have high expectations for finding open-source security tools tested in hostile environments. One that meets the standard for hacker information technology consultants is the FreeS/WAN project's free, open-source Linux-based server software that uses strong encryption to create secure data tunnels between any two points on the Internet — a needed alternative to expensive, proprietary virtual private networks (VPN).

FreeS/WAN uses the IPSec protocol, an interoperable global standard for securing IP connections. It automatically encrypts data packets at 6 bit/sec. and creates secure gateways in a VPN without modifying the operating system or application software. A PC running FreeS/WAN (*www.xs4all.nl/~freeswan*) can set up a secure tunnel in less than a second.

The software generated strong interest among the 1,800 hackers who attended the Chaos Communication Camp, the Chaos Computer Club's first international hacker conference, held here last week. Among the attendees was Kurt Seifried, an independent security consultant from Edmonton, Alberta, who uses FreeS/WAN to create secure networks for customers.

Seifried said he's encouraged by an announcement from the Ontario Information and Privacy Commission, which pointed out that the Internet wasn't secure and urged everyone to learn to use strong encryption. "Encryption is no good unless the majority of people use it," he said.

Seifried said he implemented FreeS/WAN with a client, Best Computers in Edmondton, which needed a system to let stores securely access inventory in real time. He looked at the PPTP network protocol with Windows NT servers but decided it was too insecure. "PPTP is a total disaster. L0phtcrack just goes through it like a buzz saw," said Seifried, who has posted a guide to Linux security on the Web.

MAURICE WEISS/OSTKREUZ

HACKERS, TENTS AND COMPUTERS filled a field outside Berlin at the Chaos Communication Camp last week

Instead, Seifried used FreeS/WAN to connect client machines on either side of two firewalls. He said it created a negligible load on the network and could be run on $500 PCs with two network cards to create a gateway. The system cost $3,000 in hardware for five locations, as opposed to $15,000 for a commercial VPN, he said.

FreeS/WAN's biggest drawbacks, Seifried said, are that the last stable release is several months old and it doesn't work with the Linux kernel Version 2.0. He said he advises users to examine FreeS/WAN snapshots and recommends the June 14 one.

At the camp, FreeS/WAN developer Hugh Daniels said his software is useful for e-commerce and financial interests that lose money to theft and fraud. "The entire finance system of the world leaks like a sieve," Daniels said. "Our goal is transparent encryption." ◗

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Hackers' Abilities in Demand

Advice offered for landing jobs

BY ANN HARRISON
ALTLANDSBERG, GERMANY

At the first annual Chaos Communication Camp, which took place here last week, hundreds of hackers and their machines filled the main Hacktent, exchanging information on the latest exploits and security tools. Most were young, skillful and in demand at corporate information technology departments.

The event, which attracted some of the most talented European and American hackers, was one of the largest hacker gatherings in Europe this year.

Tobias, a programmer and software developer from Berlin who watched the camp's Linux Death Match hacking competition, said he was impressed by the level of expertise. "All these people sitting here in front of these machines will never have a problem finding a job," he said. "Everyone around here knows how useful it is to find vulnerabilities, and most of these people don't destroy systems, don't crack systems — they just look at them."

David Del Torto, director of technology for security services at Deloitte & Touche in San Francisco, agreed. He noted that hackers like himself were working at the top five auditing and accounting firms.

Del Torto presented hacker career workshops with titles such as "Take This Job and Ping It/Hacking The Corporate Ladder For Fun & Profit."

"As long as you are not hacking the companies you are working for and destroying your reputation, you are going to have no problem getting jobs," he said.

Among the tips he offered hackers seeking corporate jobs: Write your own job description, volunteer for a project in your area of expertise, network with people, start your own company or join another start-up. He also advised the crowd to build tools they would use, license technology when appropriate and solve problems with free software or generate it. "When building reputation capital, it's pretty important to learn to think like the boss," he said.

Del Torto is also a member of Cypherpunks, a San Francisco-based hacking organization that produces what he described as "no-compromise" security technology.

Del Torto had advice for his Fortune 1,000 brethren, too. Asked if young hackers, who may not be partial to suits and ties, are discriminated against, Del Torto recalled that Dan Farmer, author of the widely used Satan network scanning tool, was turned down by an employer who found his appearance unsettling. Del Torto urged IT managers to focus on the reputation of the individual. IT managers interviewing young people who "act differently should remember when they were young," he said.

CHAOS
COMMUNICATION CAMP

Del Torto said that in the relatively small community of IT security professionals, people are preceded by reputations. He said he knows talented programmers whom he won't hire or recommend for jobs elsewhere because they don't act responsibly. ◗

REPORTER'S NOTEBOOK

Hackers on Holiday Network, Party

At the outdoor computing event of the summer, 1,800 hackers gathered at the Chaos Communication Camp in a field outside Berlin last week. Hackers on holiday swapped security tools, viewed lock-picking demonstrations, discussed encryption politics and went for dips in the local lake.

Organized by the Berlin-based Chaos Computer Club (CCC), the camp featured a sculpted spaceship and a "landing area" illuminated by glowing neon pillars.

Hackers in tents were connected by CAMPnet, a switched Gigabit Ethernet that was billed as the largest civilian open-air Internet network ever created. CAMPnet supported 1,500 hosts, a 34M bit/sec. Internet link and an aggregated Internet bandwidth of 20M bit/sec. Seventeen "data toilet" portable potties housed network routers. A camper who attempted to attack the network found himself cleaning toilets.

The camp's featured event was the Linux Death Match, in which teams of network administrators tried to halt one another's network services. The match was won by a team of people from Munich who chose not to attack, but instead to fortify their machine with FreeBSD (an open-source operating system like Linux) tools.

The camp's re-engineering awards went to a group that altered identification numbers on Global System for Mobile Communications cell phones and another team that defeated a biometric fingerprint-scanning system.

CCC spokesman Andy Müller-Maguhn noted that unlike the U.S., which imposes export restrictions on strong encryption, German politicians listened to advice from the hacker community and then chose not to impose similar controls.

"People here are always thinking critically about fascism, so people want to drive the technology, not be driven by it," Müller-Maguhn said.

Wuzz, a waffle vendor from Brandenburg, Germany said he saw no racism at the event, which, he said, is unusual in eastern Germany.

"Look at this place," Wuzz said. "Do you see any rubbish, any people fighting? This is a very special kind of Woodstock."

– Ann Harrison

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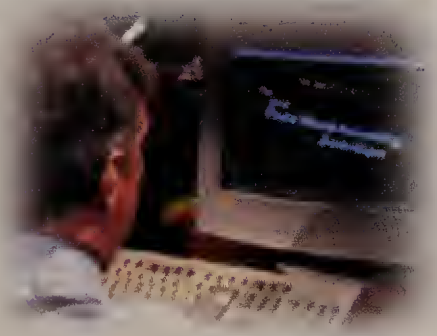

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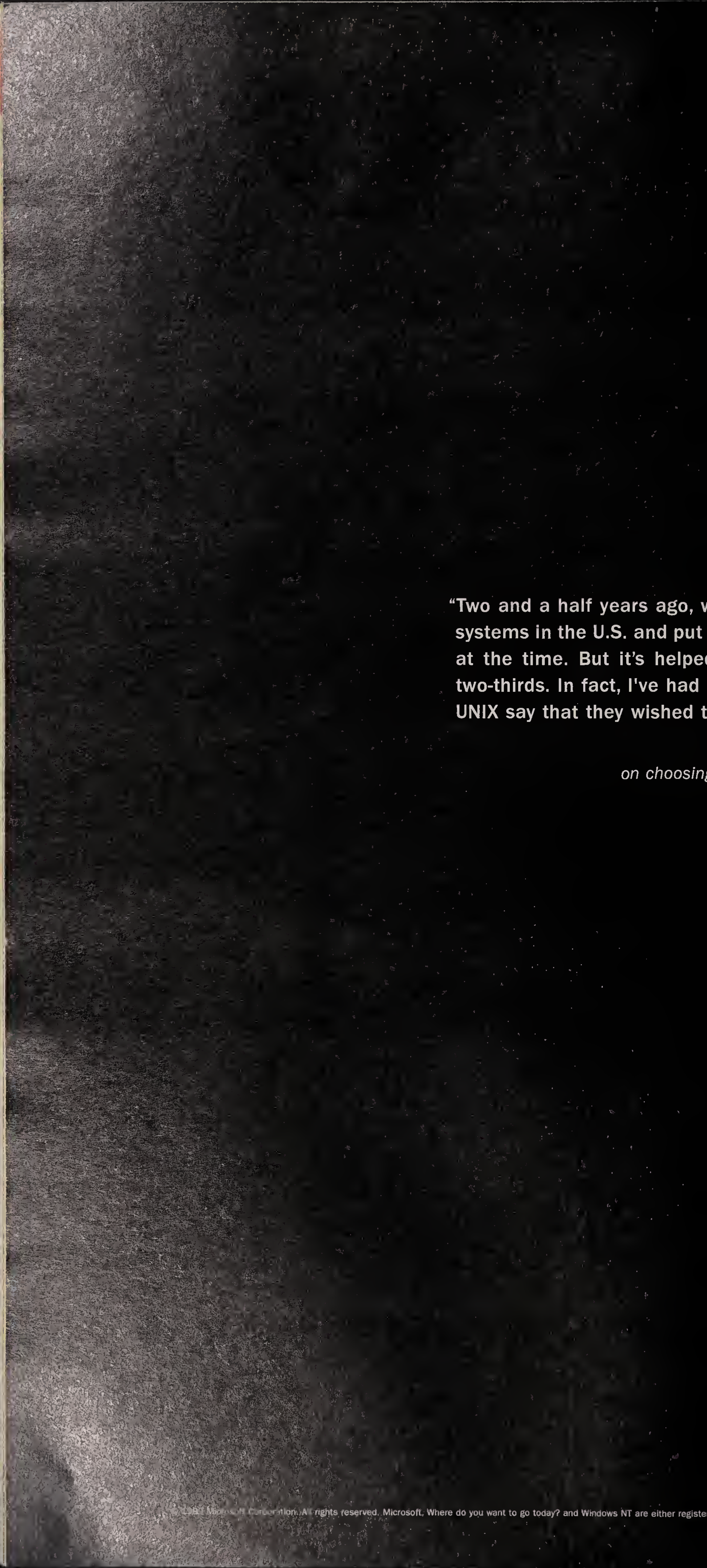

"Two and a half years ago, we took one of the most mission-critical systems in the U.S. and put it on Windows NT. It was a bold decision at the time. But it's helped us lower our cost per transaction by two-thirds. In fact, I've had a number of my peers who had gone to UNIX say that they wished they had done what we did."

Steve Randich, CIO, Chicago Stock Exchange
on choosing Microsoft® Windows NT® Server 4.0 over UNIX

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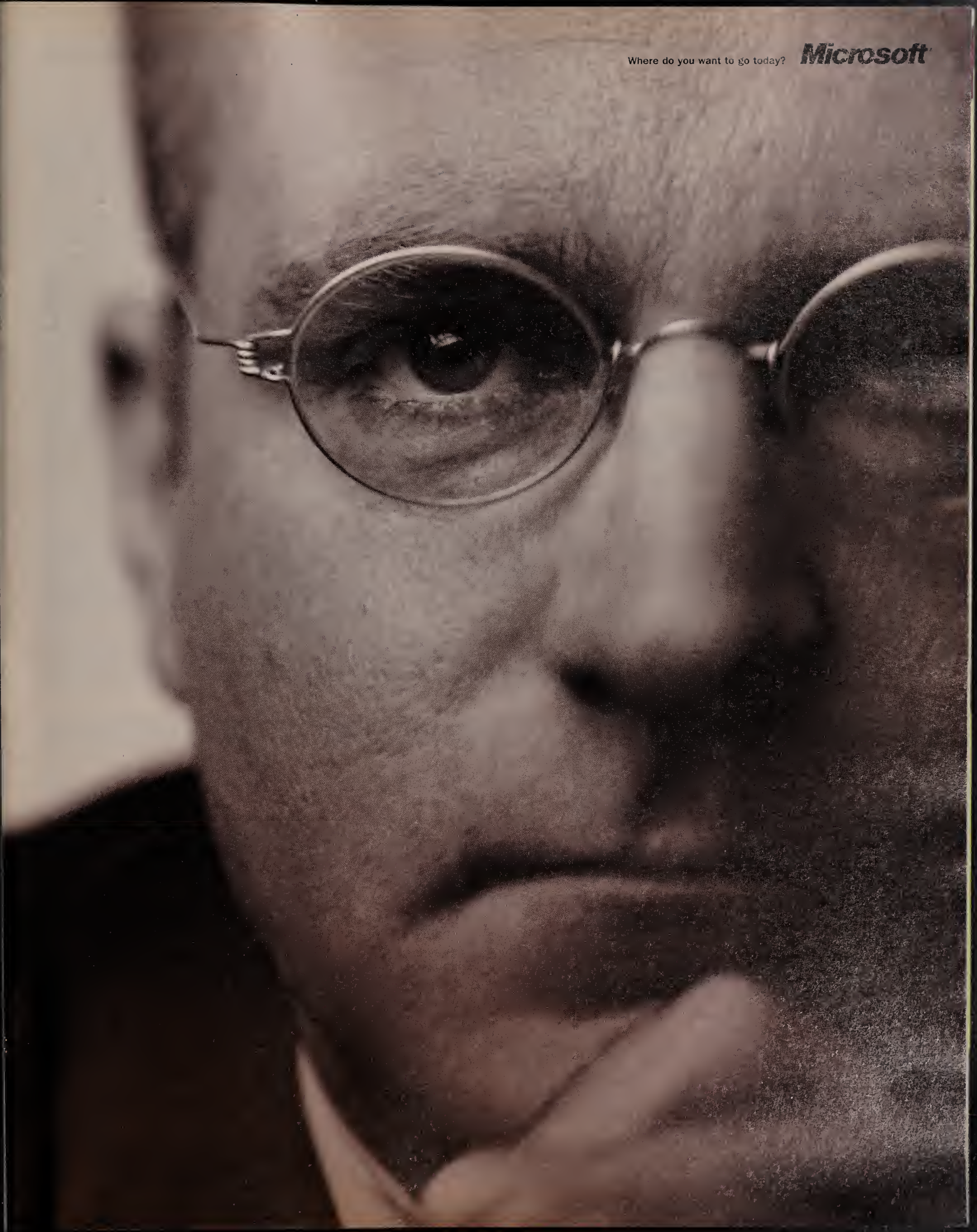
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Y2K Failures Have Hit 75% of U.S. Firms

BY THOMAS HOFFMAN

First, the bad news: Three-quarters of U.S. companies have experienced year 2000-related failures, according to an ongoing survey of information technology executives at 161 companies and government agencies released last week.

The good news: Only 2% of the companies polled have suffered business disruptions due to those glitches, because they fixed problems quickly or enacted work-arounds. That may be a positive harbinger of what may occur early next year.

The survey has been conducted by Cap Gemini America LLC in New York and by Pound Ridge, N.Y.-based Rubin Systems Inc. since 1997. It was sent to 144 major U.S. corporations across all major industrial sectors and 17 federal, state and local government agencies.

Most failures have involved financial miscalculations or have led to processing disruptions (see chart). Few have been visible because they haven't caused significant disruptions, and firms "don't have a lot of reasons to make them public," said Jim Woodward, senior vice president at Cap Gemini and head of its Trans-Millennium Services group.

Meanwhile, the number of business managers who plan to take charge of year 2000 command centers has risen from 62% in May to 84%. Business executives have a growing interest in the success of their organizations' Y2K projects, in part because "they're concerned that they may be legally liable," said Kazim Isfahani, an analyst at Giga Information Group Inc. in Norwalk, Conn.

Among the things that may make business executives nervous: Only 48% of the organizations polled expect to have all of their mission-critical systems prepared, and 16% said at least half of their most important systems won't be ready by Dec. 31.

"With full readiness beyond the reach of many leading firms, responsibility for year 2000 management has passed from the hands of the CIO into the hands of the CEO," Woodward said.

Another sign of concern: The percentage of firms "very likely" to halt business with noncompliant partners has risen 41% since May — from 21% to 36%. ◗

Gotcha!

Among the year 2000 failures that have hit U.S. companies:

92%	Involved financial miscalculations or losses
84%	Caused processing disruptions
38%	Led to customer service problems
34%	Were supply-chain or logistics breakdowns

Base: Survey of 161 IT executives at large companies and government agencies

SOURCE: CAP GEMINI AMERICA INC., NEW YORK; RUBIN SYSTEMS INC., POUND RIDGE, N.Y.

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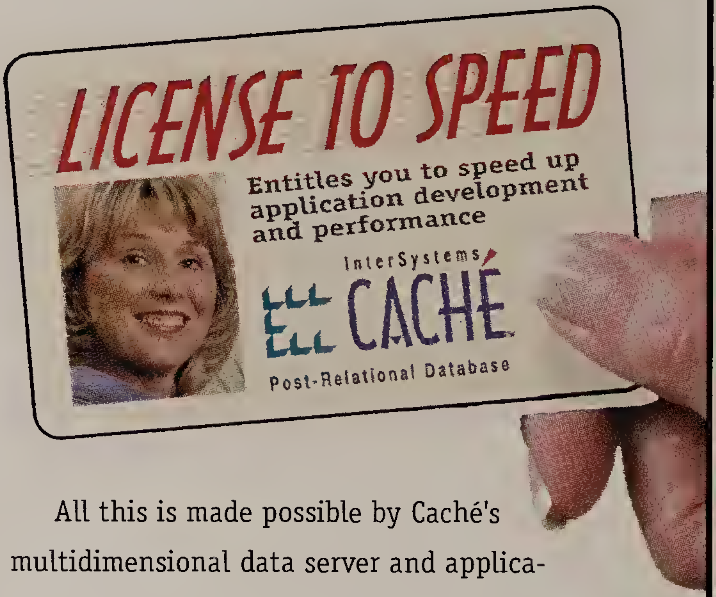
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EMC Buy Bolsters Storage

Data General to help in Unix, NT push

BY JAIKUMAR VIJAYAN

EMC CORP.'s planned purchase of Westboro, Mass.-based Data General Corp. should allow the company to expand its presence in the midrange storage market.

Hopkinton, Mass.,-based EMC last week announced plans to buy DG in a stock transaction valued at approximately $1.1 billion.

The acquisition will give EMC — which has traditionally sold storage systems to mainframe users — a chance to flex its muscles in the booming Windows NT and Unix markets.

"We think this agreement will allow us to increase our target market by as much as 40%," said EMC CEO Michael C. Ruettgers.

DG's storage products — and its associated sales force — will give EMC a chance to go more aggressively after the low-end market without sacrificing the traditional high margins it has always enjoyed at the high end, said Rob Schafer, an analyst at Meta Group Inc. in Stamford, Conn.

The DG purchase also gives EMC immediate access to DG's line of Intel Corp. Aviion servers, including its scalable Non-Uniform Memory Access machines.

According to Ruettgers, the Aviion server business will continue as a separate unit of EMC. Under the agreement with DG, EMC won't be allowed to sell off any DG assets for two years after the merger is approved.

No major layoffs are expected as a result of the purchase, according to Ruettgers.

The EMC purchase brings an abrupt end to DG's longstanding efforts to grow out of its niche-vendor status. The company, which started off selling proprietary minicomputers, has spent almost all of the past decade in the red and has been pegged as a takeover candidate for a long time.

Since shifting from Motorola Inc. chip technology to Intel processors in 1995, DG has focused on layering high-margin value-adds such as clustering and fail-over technology on top of standard Intel boxes. Most of the company's successes have come in vertical markets like the health care, manufacturing and retail industries.

On the storage side, DG mainly licensed its Clariion products to system vendors like Hewlett-Packard Co. and Dell Computer Corp. and therefore failed to establish a brand presence of its own.

"The thing that concerns me is what is going to happen to DG's Aviion and MV [line of server products]," said Steve Pounds, former president of the Data General users group, and controller at Security Forces Inc., a security services provider in Charlotte, N.C. "It would be interesting to see what EMC has in store for these [technologies]." ◗

EMC and DG: A Look at the Numbers:

	1998 REVENUE	1998 PROFIT/(LOSS)	EMPLOYEES
EMC	$4.0B	$793M	11,200
Data General	$1.5B	($152.4M)	5,000

Lucent Acquisition To Expand Services

New division to boost professional services

BY SAMI LAIS

In its 28th acquisition in 18 months, Lucent Technologies Inc. last week agreed to pay $3.7 billion for International Network Services in Sunnyvale, Calif.

Lucent's NetCare services have focused on operations support for multivendor data and video networks, voice systems and networks, and call centers. What INS brings to the table is a greater concentration on professional services, network integration and migration, and skills transfer. Both companies have worked extensively with service providers.

INS and its 2,200 employees will merge with NetCare's 3,300-person staff, said Jeff Akers, chief operating officer at Murray Hill, N.J.-based Lucent's NetCare Professional Services division. INS President and CEO John Drew will head the new division.

INS customer James Barry, CIO at Insurance Holdings of America in Beverly, Mass., said the merger will make his life easier. He has spent the past few months working out a contract with NetCare and INS for a voice and data convergence project.

Barry earlier this year deployed INS's VitalAgent to 1,100 desktops nationwide and is using other components of the VitalSuite network-monitoring software as well as INS's Enterprise Pro Web-based network performance management product.

He said he was confident that Lucent will fulfill Akers' promises of future product support. "I've never met an organization that could write code as tight as Lucent, and second is INS," he said.

Industry analysts have regarded INS as a ripe peach given its revenues of $315.1 million last year. "INS is a company that many people have thought about acquiring," said analyst Kitty Weldon at The Yankee Group. "But they've been viewed as being expensive because they're so successful."

The combined entity has "significant opportunities," said Mary Henry, an analyst at Goldman, Sachs & Co. Investment Research in New York. With a presence in more than 44 countries, "international growth is a large and relatively untapped opportunity," she said.

Henry said it's "intriguing" that San Jose-based Cisco Systems Inc. owns 7.8% of INS. The merger will "give Lucent a fair amount of information about some of Cisco's largest accounts," she said. ◗

SGI Spins Off NT, Cray Units, Adopts Linux

Company hopes to save $300M a year

BY STACY COLLETT

In the second phase of a drastic turnaround strategy announced 18 months ago, Silicon Graphics Inc. last week said it will narrow its focus by adopting Linux as its exclusive operating system. It also will spin off its Windows NT workstation unit and its Cray vector supercomputer division into separate businesses that will be co-managed or sold.

The company hopes to save $300 million annually with the reorganization, which will result in the elimination of about 1,500 jobs.

SGI will continue to support its Origin servers for high-performance computing. Revenue for that line grew 30% last quarter over the year-earlier period. It will also continue to focus on its less profitable visual computing business but will sell to the lower end of the market through its alliance with NVidia Corp.

The moves come as SGI tries to sustain profitability after more than two years of unimpressive revenue growth. Last month, the company reported its first profitable quarter in 18 months, with $157.8 million in profit. Most of the gains were in its server business.

The Mountain View, Calif., company will also enter the broadband Internet server market, CEO Rick Belluzzo said. Broadband content "will force a complete rebuilding of the infrastructure of the Net," he said. "This represents an opportunity for SGI." To handle broadband, servers will have to be upgraded by up to 10 times their current capacity.

SGI plans to phase out its Irix operating system. RISC processors will remain part of SGI's architecture "where we have competitive advantage" such as in the entertainment sector, Belluzzo said.

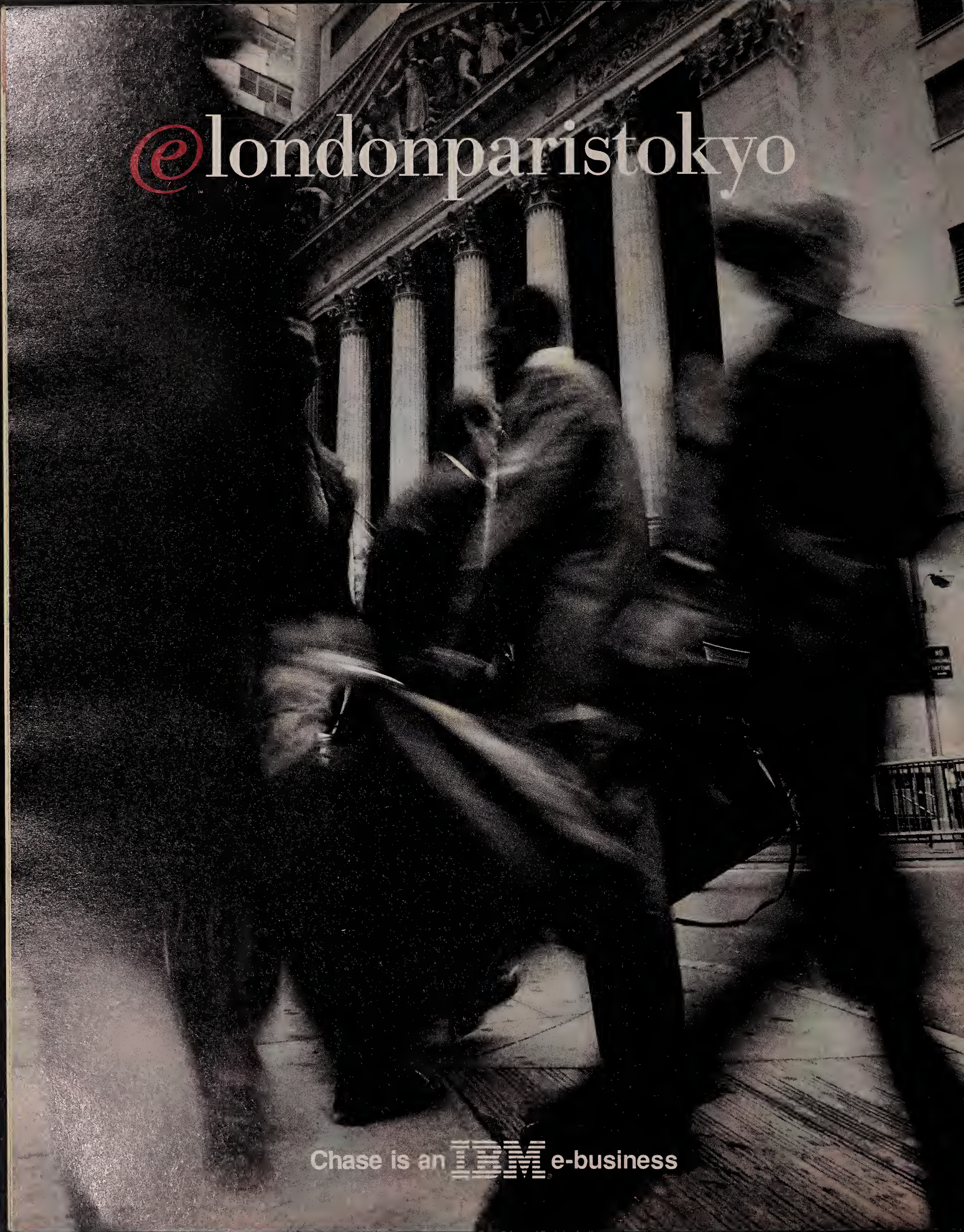
Some observers said planting a flag on Linux was one of the few turnaround choices the company had. "They've tried NT, but the cost vs. volume doesn't work for them. The software development support for Irix is slipping very seriously. So they go to Linux," said Daniel Kunstler, an analyst at J. P. Morgan Securities Inc. in San Francisco.

Even so, SGI said it has reached a preliminary understanding with another computer systems company to extend its Windows NT product line. ◗

SGI's Turnaround Strategy, Part 2

- Spinning off Cray supercomputer division and Windows NT unit
- Narrowing focus to servers and visual computing units
- Entering broadband Internet server business
- Cutting 1,500 jobs
- Reducing expenses by $300 million annually

SOURCE: SILICON GRAPHICS INC., MOUNTAIN VIEW, CALIF.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As business goals evolve, the IT infrastructure is "already ready" to respond – a strategic advantage for Chase. "This allows us to stretch our imaginations," says Global Technology Executive Paula Sausville, "to deliver really powerful solutions to the business." IBM business integration software is also stretching imaginations at companies as diverse as Toyota and Texas Instruments. You'll find their stories and others at our Web site.

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MARYFRAN JOHNSON

Y2K scapegoat

DOESN'T IT JUST FIGURE? Right when you thought every possible scenario for the year 2000 problem had been identified and analyzed ad nauseum, Y2K is elevated to the dubious status of national scapegoat ["Get Ready for Y2K False Alarms, Panic," Page 1, Aug. 9].

This phenomenon of blaming Y2K glitches for everything from downed power lines to airline delays is a classic example of the old press joke about never letting the facts get in the way of a good story. So the media definitely deserve a few lumps for leaping to conclusions, as they did a few months ago when the New Jersey Department of Human Services mistakenly awarded $23 million in food aid 10 days too early.

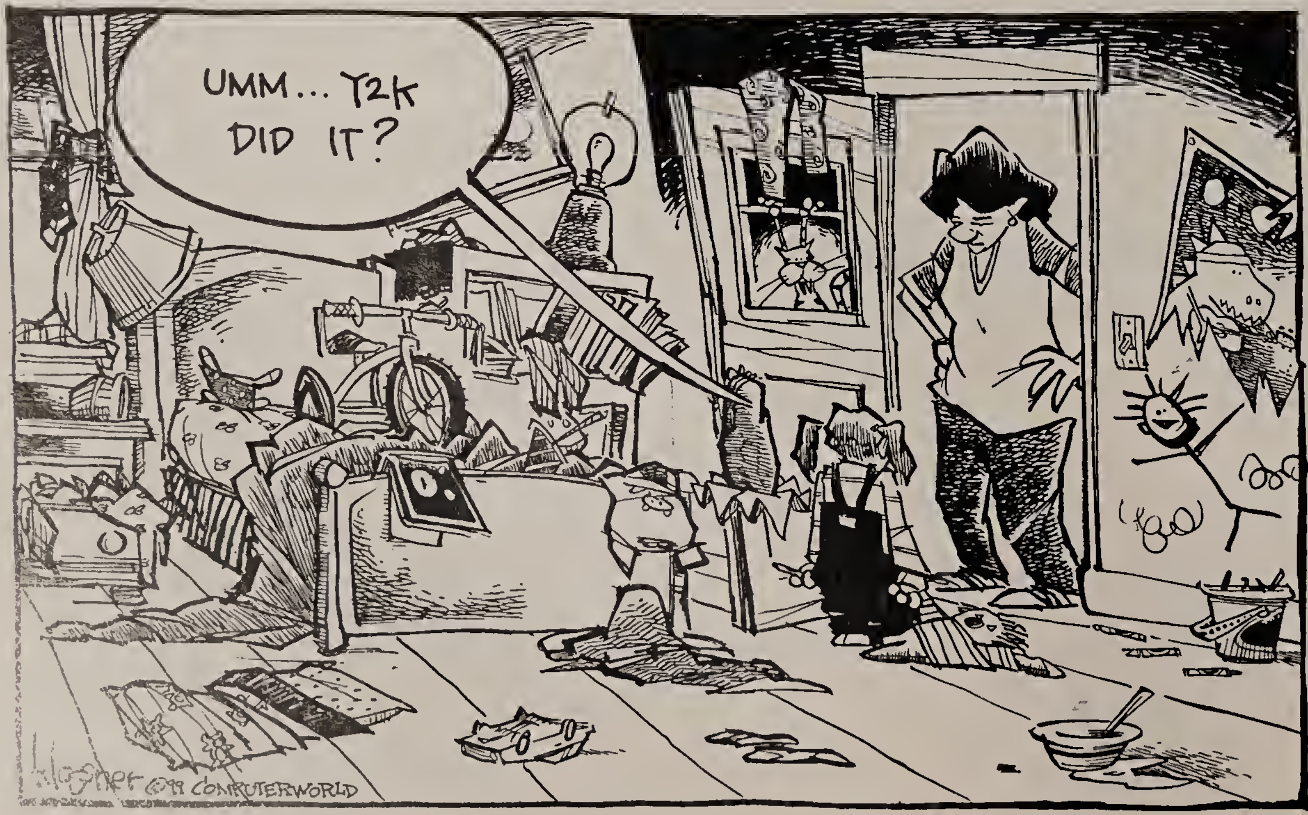
MARYFRAN JOHNSON is editor in chief of *Computerworld.* You can contact her at maryfran_johnson@computerworld.com.

But it's also an issue for your companies to deal with internally, as American Airlines discovered in June when its own gate agents falsely blamed Y2K testing for takeoff delays.

This whole Y2K issue — the biggest IT headache in 50 years — has really run the public perception gamut. It started out as an oddball technical flaw, moved up to genuine IT concern, then on to full-blown business crisis and legal bonanza. Now, it's graduated to urban legend-in-the-making. And the latest beneficiaries will be public relations and marketing firms. Listen to the CEO of a New York public relations firm, whom we quoted in our cover story last week: "We believe that Y2K has the potential to be a major disruption for companies, even if not a single computer malfunctions." How maddening that must be to all the IT professionals who have been knocking themselves out fixing this problem!

In fact, 75% of major U.S. companies have already had Y2K failures and nobody even noticed, according to a study out last week from consulting firm Cap Gemini America. Only 2% of the 144 companies surveyed had business disruptions as a result (see News, page 28). It's the insignificance of that 2% that's really worth celebrating.

In the meantime, take measures to keep the Y2K scapegoat from your door. Keep talking to employees about your company's Y2K status. Make sure your own public relations people are completely in the loop with the Y2K team. And when and if the media call, be ready with quick, accurate answers. ▶



BILL LABERIS

The next high-tech buyout: Your local police

WHAT'S WRONG with giant computer companies paying local police departments tens of thousands of dollars to help the cops fight computer theft and piracy?

That's what Intel, Hewlett-Packard, Motorola and others are doing, according to a syndicated story in the *Los Angeles Times* last month. They're contributing hard cash, paying for out-of-town travel and even kicking in the use of company jets and other corporate resources to help "financially strapped" police departments fight the rising tide of computer crime.

BILL LABERIS is a consultant in Holliston, Mass. and former editor in chief of *Computerworld.* Contact him at bill@laberis.com.

I don't care if the cops bust Al Capone IV with corporate funding, the idea stinks.

Yes, I know all the reasons why corporations and the local constabulary should forge a rock-$olid partnership to fight computer crime. The usual saw is that police budgets are consumed fighting drugs, rape, murder and domestic violence, and there's little if any left to protect the corporate mastodons and their inalienable rights.

The *Times* reported that these computer companies "expect law enforcement to treat computer crime as seriously as drugs and gang violence." If this is true, someone should remind the companies that crimes against corporations and crimes against human beings are quite different things, as the human victims would attest.

Further, I would have to believe that these corporate-sponsored computer crime units are plum assignments, delegated to the most experienced cops. Wouldn't the public be better served if the best and brightest are instead chasing murderers, rapists, drug dealers and their ilk?

And what happens if there's any illegal funny business brewing at the corporations? Would the local police investigate the companies knowing they are direct benefactors?

Also, let's not forget the concept of dependency. Government entities of any type become wholly dependent upon outside funding almost immediately upon its inception. So let's say a company funding a special crime unit is bought out or hits hard times. What happens to the anticrime funding then? It goes away, as do the months and years of special training for the computer Mod Squad.

Clearly, crime is crime and should be dealt with in as expedient a manner as possible, with certain punishment upon conviction. No defense-attorney deals or liberal judges handing out politically correct sentencing. So elevate computer crime to the proper level of importance in the scheme of things and fund the fighting thereof accordingly.

As for the arguments that police don't have enough money to fight all the crimes they need to fight: hogwash. We are in the midst of the most spectacular economic boom in the history of mankind. Federal, state and local governments are awash in tax revenues just about everywhere — particularly where the high-tech sector roosts. If fighting computer crime is all that important to society (and it should be seen as such, by the way), then spend the damn money to do so — *public* money. ◗

GEORGE K. WILLIAMS

Let's close the racial ravine on the Internet

COMPUTER TECHNOLOGY and the Internet offer seemingly endless possibilities. However, today's hype shouldn't cause us to overlook the issues that could hold back these technologies from reaching their full potential.

For African-Americans and other minorities, there are two simmering problems that can affect a society that is counting on Internet-based e-commerce to fuel economic growth:

First, there is an increasing technology gap among racial groups in the U.S. In July, the Commerce Department released a well-publicized report showing that African-Americans and Hispanics are less likely to own computers, or have Internet access, than whites. The department labeled this gap as a "racial ravine" to highlight the significance of the difference.

GEORGE K. WILLIAMS, a senior account executive at TRW Systems & Information Technology Group in Cleveland, is the national president of the BDPA Information Technology Thought Leaders (*www.bdpa.org*), an organization that represents the interests of African-American IT professionals. Contact him at **georgekwilliams@email.msn.com**

Second, many companies state that they are unable to hire minorities for technology positions, even though they wish to. They claim that they can't find minority members with current computer skills and that those they do find either lack the skills they need or are unwilling to relocate.

Though this perception is inaccurate, it contains a grain of truth. There are many ambitious and well-trained minority IT professionals, but there could be many more. The problem is that many people in underprivileged areas are unaware of the changes and opportunities presented by the Internet because they haven't been exposed to it or properly educated. The attack on colleges' affirmative action programs, by endangering access to college-level technical education by minorities, can only aggravate this problem.

I don't want to provide the impression that African-Americans are making excuses. However, as the report indicates, there is a significant computer literacy, awareness and accessibility problem within minority communities. Now that the problem has been brought to light, we should do something about it.

The Black Data Processing Associates (BDPA) IT Thought Leaders, like many other concerned organizations, is already working to solve these problems. For example, together with the National Urban League, we are supporting a joint initiative to establish Emerging Technology Centers that will provide hands-on job training and technical support for local communities throughout America. Our volunteers are also involved in adult education programs and sponsor programs in elementary, middle and high schools.

However, efforts like these will not be sufficient to solve the problem. Government and corporate leaders must respond with the same national vigor that went into the Gulf War or fixing the Y2K crisis.

Where do we begin?

First, instead of many organizations placing resources in uncoordinated programs, our collective efforts should be coordinated by a national, federal government-supported technology education assurance initiative that would coordinate resources and implementation of technology awareness and training in urban areas. Industry would advise educators on what is needed in the workplace of the future and supply educational institutions with the resources to develop needed programs.

Second, we need a deadline to drive the importance of this effort. There should be a specific target date when computer technology training will be available nationwide for the minority population.

Though this may be viewed as wishful thinking, the reality is we cannot continue to move forward into an era of global competition unless all Americans are made aware of the opportunities of the Internet era and have access to computer training. We in business talk about "best practices"; let's apply our best practices as a nation to build this opportunity together. ◗

READERS' LETTERS

AMD's chips deserve CW's attention

COMPUTERWORLD has been very fair when it comes to discussing Windows NT vs. Unix and x86 chips vs. RISC. Why not be just as fair within the x86 market? Weeks, even months, before Intel introduced the Pentium III, there were articles upon articles of information about the new processor.

There are many alternatives. Take, for instance, AMD. As a PC hobbyist at home, I've never used an Intel chip. From my 486/66DX2 to my K6-2 300, every chip I've owned has been an AMD. And I don't run just little programs. The problem with the industry is that anything other than Intel is viewed as cheap and unreliable.

AMD released its newest chip a few weeks ago — the K7, now called the AMD Athlon. This chip can be arranged for multiprocessing without limit, and it outperforms the Pentium III — according to AMD, at least.

You ran an article that focused on AMD's stock price hitting the floor because of production problems ["AMD Post Loss of $162M; President Resigns," News Industry, July 19]. Maybe it's because AMD has been beaten into financial submission from the propaganda of the Wintel organization. Intel is not the only x86 chip maker and certainly not the only competent one.

Tom Walker
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Let's tax e-mail

REGARDING David Moschella's column "Let's Stop Fussing Over Taxation of Internet Sales" [News Opinion, July 5], since when are taxes about fairness? Taxes are about raising funds to pay for governmental services. Are there states running huge deficits now?

Of course not.

Also, isn't it unfair that those of us who have e-mail at work are getting a free ride while poor mom and pop still have to write letters, buy stamps and use gas to get to the post office?

Let's tax all that e-mail. It's only fair. Maybe Al Gore should file a copyright for inventing the Internet and turn his income from it over to the government.

Patrick Ford
Sugar Land, Texas

E-book devices are just excess baggage

WHY BOTHER with a separate device to read e-books ["E-Books: Still An Unfinished Work," Technology/Exec Tech, July 19]? I own a Palm V, and over the last several months, I have read over a dozen e-books on the Palm.

Some of these books are public domain books available from sources such as Project Gutenberg or MemoWare; others are commercially available books from sources such as Peanut-Press and Online Originals. By incorporating the e-book into the Palm V, the book is always with me. The Palm V weighs only 4 oz., and I don't have any extra baggage. Yes, the screen is small, but the convenience makes up for it.

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More Letters, page 37

COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Allan E. Alter, columns editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 875-8931; Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

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Left to right: Compaq AlphaServer, Compaq ProLiant, Compaq NonStop Himalaya

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DAVID MOSCHELLA

It still makes sense to invest in dot.com stocks

INTERNET STOCKS have certainly been falling steadily, but they aren't about to totally collapse. Although investors like to think in terms of growth and earnings, stock prices are mostly a matter of fundamental beliefs, and only when those beliefs change do markets radically move. All hype aside, today's Internet enthusiasm rests on a foundation of six core, but often unstated, beliefs, most of which still appear valid.

DAVID MOSCHELLA is an author, independent consultant and weekly columnist for *Computerworld*. Contact him at dmoschella@earthlink.net.

Revisiting those basic assumptions should be a key part of any investor's reality check. Here's how things look now:

There is a widespread belief that e-business will generally prove superior to non-e-business. That is still a no-brainer. There will be huge portions of the economy where Internet-based activity will be unquestionably faster, cheaper, more innovative or somehow just plain better than previous ways of doing business. Would you want to make the case otherwise?

There is an underlying assumption that Internet-based opportunities will dwarf those of the PC era. That may seem like common sense. But if you add up the stock market capitalizations of all the supposedly overvalued dot.com companies, they still don't come close to the combined worth of just Microsoft and Intel, let alone the rest of the PC industry. That suggests that tremendous growth lies ahead.

There is a general sense that many of the leaders of the pre-Internet world won't respond effectively to today's dot.com challenge. Certainly, both the early years of Internet competition as well as the entire history of the IT industry suggest that it's much easier to start a brand-new company than successfully shift from one business paradigm to another. Who are you betting on — Amazon or Barnes and Noble?

There is a widespread belief that each Internet market segment will be dominated by a single "gorilla" firm, just like the software, microprocessor and networking equipment businesses. That is certainly possible but not inevitable. Happily, Internet companies can't generate the software lock-in so typical of previous IT eras. But dominant leaders could still emerge in many categories because of the Internet's vast economies of scale. I'd watch this area carefully.

There is a general sense that today's U.S. dot.com leaders will, just like Microsoft, Intel, Oracle, et al, eventually go on to become global powerhouses. Clearly, this won't be the case with many telecommunications services. But even in content and commerce businesses, U.S. firms won't necessarily walk over their in-country competition. The opportunity is there, but it's not that easy for an Amazon or Schwab to "get local."

There seems to be unwarranted confidence that the current Internet market leaders will be able to maintain their positions. That belief is central to today's huge individual company valuations, but it flies in the face of most of the IT industry's history. Consider early PC leaders like Commodore, Visicorp and Epson, or even Internet pioneers like Netscape, PsiNet and AltaVista.

Overall, the evidence seems to indicate that investing in a broad range of Internet businesses should eventually pay off handsomely but that betting on individual companies is highly risky. Internet mutual funds may look shaky right now, but they still seem like the logical place to be. ◗

JOHN GANTZ

Can anyone in this industry learn from history?

HEY, I JUST remembered. This month marks my 25th anniversary as an industry analyst. Mostly this is a liability. How can I possibly keep up with younger, more buzzword-endowed competitors? By the time I realize a "portal" is another word for what I used to call a "gateway," the term has already morphed into something else.

JOHN GANTZ is a senior vice president at International Data Corp. in Framingham, Mass. Contact him at jgantz@idcresearch.com.

But being a tribal elder has an advantage in at least one area — watching people repeat the mistakes of the past or wrestle with age-old problems.

Take Internet stocks. Why is Yahoo's market valuation higher than God's? Not because Yahoo has more assets, but because there's simply too much money around. Venture capitalists invest in Internet stocks because there are investment bankers willing to take companies public because there are funds and investors hoping to find the next Microsoft. This booming economy is throwing off cash like nobody's business, creating an incredibly rich financial food chain.

The PC industry went through all this in 1982 and 1983. A change in government rules for pension fund investing in the late 1970s multiplied the venture capital available by a factor of 10 — right about the time the PC was invented. Fifty companies went public in 1982 and 1983. But then they needed to begin making a return, and by the end of 1984, PC stock valuations had dropped in half, most of the start-ups were out of business or on the ropes and the venture capitalists had moved on to biotech. You think there won't be an Internet stock crash? Ask the founders of Eagle Computer, Victor Computer, Vector Graphic and all the rest. Think twice about which start-ups you commit to.

Or take the antitrust suit against Microsoft. About the only difference I can see between that and the IBM antitrust suit is the age of the judge and the speed of the trial. When Sun Microsystems or Netscape complain about Microsoft's strategies and tactics, I find myself about as moved as I was when Telex or Memorex complained about IBM selling its own disk drives to users. I doubt that any of the smaller companies would act differently if they were in Microsoft's position. (AOL's iron clamp around its Instant Messenger technology seems to bear me out on this one.) In both cases, the users themselves seemed to look upon the monopolist rather favorably.

If my understanding of history is right — as well as the theories of professor Clayton Christensen of Harvard Business School and *The Innovators' Dilemma* fame — then Microsoft is more likely to fall from within than from the U.S. Department of Justice. Don't count on the government having much impact on the Microsoft market — or on Microsoft being here forever.

How about the basic IT job function? Back then — in the advent of the PC era — the big crisis was in managing technology at the business-unit level. PCs and word processors were streaming into companies, and IT managers were wringing their hands about losing control of computing resources. I'd run around the country giving speeches to IT managers about how they ought to *embrace* the technology and become heroes in their organizations. Right about then, the term CIO came into vogue.

It's not much different today talking to CIOs about Internet technology being put to use in the new online divisions they are being asked to support. New career opportunity, new career success factors — and a struggle for the more conservative and risk-averse CIOs to deal with. Now I run around the country giving speeches telling CIOs they ought to *embrace* the technology and become heroes in their organizations.

I won't tell you that I've seen it all before, though. I've seen only some of it. I believe we have plenty of opportunity to make fresh mistakes and find totally new problems. We're creative that way. ◗

READERS' LETTERS

Ms. MIS on Target: Vendors Should Abandon Adolescent Sales Pitches

As a female information systems manager, I fully appreciate Kathleen Melymuka's column on sexually explicit advertisements at a woman's expense ["Boorish Pitches Won't Sell IT to Women," Ms. MIS, Business, July 19]. My response is to call the contact number cited in the ad, request that my company's name be removed from their mailouts/list server and explain the reason. Poor judgment notwithstanding, the advertiser will eventually figure out that zero customer output equals zero customer dollar input.

Linda Lee
Mansfield, Texas

I have been railing about this since 1969, when conferences featured women in bikinis pouring shots. At a recent conference, a comely young lass was running a shoeshine booth that primarily featured her cleavage and derriere when she was bent over.

A few years ago, I wrote in protest to a firm that was using Elvira, mistress of darkness and legendary cleavage, to promote a software product. The advertising manager wrote back that the response to the ads was the highest they had ever received. Sigh. Yes, it is "Revenge of the Nerds" as the target market.

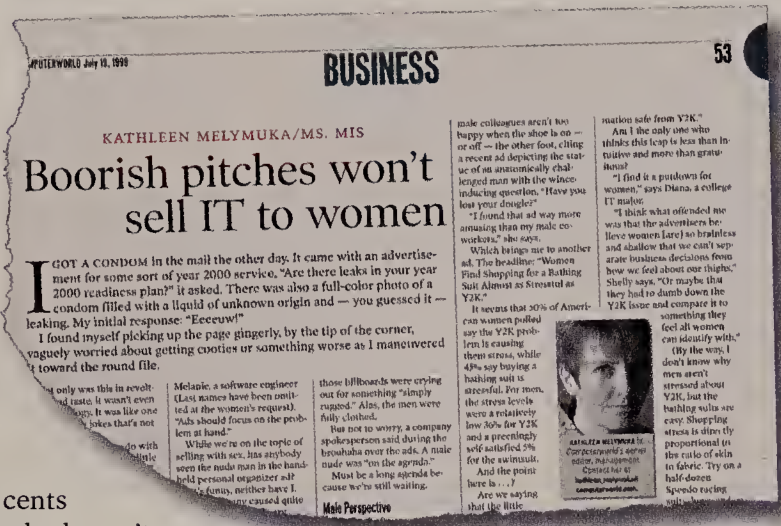
Nancy J. Johnson
Minneapolis
johns024@tc.umn.edu

Kathleen Melymuka's article left her guilty of the very thing she deplores: discrimination. Does that mean boorish pitches should sell information technology to men? Sex in advertising is in poor taste, period — but that's what Melymuka missed. Her comments imply that discretion and propriety are the domain of women and that IT is full of men wearing taped glasses, sporting pocket protectors and salivating at the least suggestion of sex. Moronic cheap shots about sex and gender are just as offputting to some men as to some women.(And by the way, I've worked with women who guffaw more than the guys over such humor.)

Matthew E. Ferris
Wheaton, Ill.

As a longtime male, let me assure you that I would also have found the ad in disgustingly bad taste. I would resolve never to do business with a company that did that. I can't imagine who they think they're marketing to, unless it's adolescents who haven't outgrown scatological humor yet.

Bruce H. Burton
Green Bay, Wis.



PUTERWORLD July 19, 1999

BUSINESS

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KATHLEEN MELYMUKA/MS. MIS

Boorish pitches won't sell IT to women

I got a condom in the mail the other day. It came with an advertisement for some sort of year 2000 service. "Are there leaks in your year 2000 readiness plan?" it asked. There was also a full-color photo of a condom filled with a liquid of unknown origin and — you guessed it — leaking. My initial response: "Eeeeuw!"

I found myself picking up the page gingerly, by the tip of the corner, vaguely worried about getting cooties or something worse as I maneuvered it toward the round file.

Melanie, a software engineer (Last names have been omitted at the women's request). "Ads should focus on the problem at hand."

While we're on the topic of selling with sex, has anybody seen the nude man in the handheld personal organizer ad? ...'s funny, neither have I.

those billboards were crying out for something "simply rugged." Alas, the men were fully clothed.

But not to worry, a company spokesperson said during the brouhaha over the ads. A male nude was "on the agenda."

Must be a long agenda because we're still waiting.

Male Perspective

male colleagues aren't too happy when the shoe is on — or off — the other foot, citing a recent ad depicting the statue of an anatomically challenged man with the wince-inducing question, "Have you lost your dongle?"

"I found that ad way more amusing than my male coworkers," she says.

Which brings me to another ad. The headline: "Women Find Shopping for a Bathing Suit Almost as Stressful as Y2K."

It seems that 50% of American women polled say the Y2K problem is causing them stress, while 45% say buying a bathing suit is stressful. For men, the stress levels were a relatively low 36% for Y2K and a seemingly self satisfied 5% for the swimsuit.

And the point here is . . . ?

Are we saying that the little

mation safe from Y2K."

Am I the only one who thinks this leap is less than intuitive and more than gratuitous?

"I find it a putdown for women," says Diana, a college IT major.

"I think what offended me was that the advertisers believe women [are] so brainless and shallow that we can't separate business decisions from how we feel about our thighs," Shelly says. "Or maybe that they had to dumb down the Y2K issue and compare it to something they feel all women can identify with."

(By the way, I don't know why men aren't stressed about Y2K, but the bathing suits are easy. Shopping stress is directly proportional to the ratio of skin to fabric. Try on a half-dozen Speedo racing

Ads reflect the advertiser, and ads that lack common decency and fail to respect others can only be a reflection of the type of ethic that particular company lives by. Years ago, a data warehouse firm had an ad that, in my opinion, denigrated women. From that point on, I never suggested that firm as a viable alternative.

Steve Cooney
West Hartford, Conn.

I don't remember being this incensed about an IT topic in quite a while. I'd like to know the names of the vendors that produced this type of advertising, I want to communicate my anger to them, and I want to avoid their products or services.

I have encountered quite a few male colleagues who thought that the "girls" have only one place in this field: to prepare and deliver coffee. These dinosaurs will soon be extinct. But their attitudes rub off. Colleagues have told me I often demonstrate the same chauvinistic qualities.

Max Maw
Medford, N.J.
maxmaw@bellatlantic.net

Not 10 minutes before I read your article, I had totally dismissed researching a product because the focus of the ad was some model — just a head-and-shoulders shot, but, let's just say she looked like she was having way too much fun for somebody trying to pitch desktop customization. I get ticked off by ads that use such obvious lures, and I reject the products accordingly. Not only do such tactics slam women in the ways you mention, they assume that all IT men are "Revenge of the Nerds" types.

Scott Newton
Bellingham, Wash.

I do not consider myself to be a "liberated" male, but my parents didn't raise me to be a stupid macho man, either. A picture of a beautiful woman may catch my eye, but it also offends me when advertisers use sex to try to influence my buying decisions. If the picture looks like something that belongs on a porno site, I make it a point to avoid contacting those companies. The lack of class in their ad is a clear signal to turn the page.

Doug Porter
Tucson, Ariz.

Kathleen Melymuka's main point seems to be that women do not want anything with sexual images in advertising. If that's the case, then women need to lighten up. I'm not saying that women, or men, should never be offended by sexual innuendo, but we need to raise the bar a bit and learn to relax. Granted, the condom ad is disgusting, but what happened to writing to the company to voice your concern?

By the way, I noticed on the next page of your publication an article about stupid users. It included a story about a "well-endowed" woman and the problems she caused. There was a drawing illustrating what the author meant. I wasn't offended, but I assume Melymuka was. Perhaps her campaign to cleanse IT of sexual innuendo should begin with this magazine.

Jeff Peterson
Eden Prairie, Minn.
jpete007@mciworld.com.

You're right on the money. Now, if the salesdroids that think up this tripe will just read and heed.

David A. Bandel
Bellevue, Wash.
dbandel@ix.netcom.com

I would like to thank you for your commentary on distasteful, gender-biased advertising. I, too, am offended by nudity and sexual innuendo in advertising. We in IT have been working to create a culture of gender equality and professionalism. By using offcolor jokes and nudity, advertisers are rejecting the gains in gender relations for which we have been striving.

My concerns are not limited to advertisers. I have found of questionable merit references to Playboy Enterprises Inc. in *Computerworld*. For example, allusions to the "mystique" of working at Playboy in "What's it like to work at . . . Playboy" [Business, May 24] were clearly not intended for a female audience. I question the inclusion of such an article in a publication intended to serve the full IT community. I also question such a positive portrayal by *Computerworld* of the leading publisher of pornography in the U.S.

Scott Corley
Seattle

Avoid Microsoft Applications to Avoid Peril by E-Mail

I certainly appreciated Paul Gillin's News Opinion piece "Peril by E-Mail" [June 21], but I would like to tune his comments just a bit: The problem isn't e-mail attachments per se, but e-mail containing *executable content* combined with applications and operating systems that give full reign to that content, allowing it to alter local files and wreak havoc.

To cut to the chase, the problem is almost always with Microsoft Office documents. In its haste to add product features, Microsoft failed to include even the most basic elements of security that could prevent this sort of thing from happening. E-mail attachments have proved hugely productive to corporate America, and I would hate to see us abandon these gains because of a few cybervandals taking advantage of some sloppy products.

James Arnold
Helena, Mont.

Kevin Chambers ["Manager Can Identify With E-Mail Pain," Readers' Letters, July 26] can stop hoping — there's already a solution to problems with e-mail viruses.

My company's LAN uses NetWare and Corel WordPerfect Suite for core applications. WordPerfect Suite is not susceptible to Word or Excel viruses and can create and read files that are compatible with more releases of Word and Excel than any version of Microsoft Office.

When senior management asked why we hadn't switched to Microsoft NT and Office like most other branches of our corporation, I asked them how many times they've had to clean viruses from their systems. They said, "None," and I said, "Exactly."

It doesn't take a genius to avoid disaster; just avoid being a lemming.

Quentin Walker
East Granby, Conn.

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BUSINESS

THE PRICE OF SUCCESS

Unexpected problems plague even Web sites that are successful. Home Depot found that better-educated customers require better-trained salespeople; and American Airlines just couldn't keep up with its popularity. ▸ **40**

LESSONS FROM WOODSTOCK

Woodstock '99. Sex, drugs and rock 'n' roll? Well, yeah. But also instant technology, online marketing and e-business drivers all over the place. There are great customers in the crowd, if you know how to appeal to them. ▸ **42**

HIDDEN COSTS

Bundles of hardware, software and services can be attractive because they're easy to buy. But Joe Auer warns that packaging can hide more costs than you would think. ▸ **56**

INVENTORY PLANNING

Last year, Gymboree's profits plunged because of an inventory glut that forced the company to cut prices on popular items just to get them out of the stores. A new pricing system promises to keep sales brisk. ▸ **40**

DULL BUT USEFUL

Everyone's talking about hot e-commerce jobs, but many of the solid IT career-building jobs are in less sexy production environments. And they often offer better career paths. ▸ **52**

KEYS FOR Y2K CONTINGENCY

Pessimism is the key to effective contingency planning, Ed Yourdon writes. After a year of making sure nothing will fail, it's hard to assume something will. But if you don't, you'll miss the glitch that only looks fixed. ▸ **44**

CONSULTANTS: FORGET LOYALTY

Turnover rates at consultancies can hit 40%, but the perks that work to retain other kinds of staffers aren't that effective with consultants. They can change agencies so easily that most go for the highest rate and ignore other factors. ▸ **50**

E-MODELS

Business QuickStudy: Business models in the brick-and-mortar world are well understood, but what models succeed online? Fluid ones. Think leverage and alliances. ▸ **53**

BAD KARMA IN THE WORKPLACE

Rundown workplaces can hurt both recruiting and retention, a new study shows. ▸ **53**

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GREEN MOUNTAIN COFFEE CIO JIM PREVO: "Now it's getting fun again"

ALAN JAKUBEK

CHARTING A COURSE FOR ERP

MANY USERS STRUGGLED to install enterprise resource planning systems to help take care of Y2K problems and streamline back-office functions. Now they're trying to get a better return for all the pain they suffered turning the systems into platforms for — among other things — e-commerce or customer management applications.

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Gymboree Gets Serious On Inventory Problem

New system can tweak prices to move merchandise, may help plan purchases

BY DAVID ORENSTEIN

LAST YEAR was one of Gymboree Corp.'s worst. Overstocking the stores cut the firm's profits 82%, and the stock slid from prices in the mid-$20s to single digits.

Because it bought too much inventory, Gymboree had to clear out merchandise at discounted prices, even on items that were selling well at full price. It also couldn't move new merchandise into the stores as quickly, costing the company sales opportunities.

Now information technology is the source of a multipronged counterattack to solve the problem. The first effort, an inventory control, decision-support system that uses a mathematical model from Technology Strategy Inc. in Cambridge, Mass., won an award in June at the Retail Systems '99 conference in Chicago based on the votes of its industry peers.

The second effort, adoption of San Mateo, Calif.-based Blue Martini Software Inc.'s Web merchandising software, will aid a companywide effort to overhaul the way Gymboree presents merchandise to customers and gather more data about customers by collecting customer preferences and customizing what they see online.

Carver Johnson, CIO at the Burlingame, Calif., children's clothes retailer, gave *Computerworld* senior writer David Orenstein an overview of the company's technology plans for its "rebirth."

Q: How does the decision system help avoid overstocking?

A: It was an attempt to really get our arms around our inventory position and how we go about pricing that merchandise . . . and going about it in a way that is somewhat scientific as opposed to guessing when we should be marking things out of stock or taking things to different price points.

KATHRIN MILLER

GYMBOREE'S CARVER JOHNSON says the company is looking at an enterprisewide system revamp

What we did in Phase I, what we got the award for, was [a system] to allow us to manage the inventory that we own and optimize our gross margin dollars based on that. That was more of a reaction-type of an approach.

Where we are going, however, is now putting in more systems that will allow us to make the correct buy up front [to decide what to buy, rather than just manage prices on merchandise already in stores].

Q: How will Blue Martini help not only the Web site, but also the stores?

A: That really is my goal in this. Our goal for the Web was really to relaunch that Web site in a major way and do it as quickly as possible. [But] we really wanted to learn a lot more about our customers shopping us on the Web.

And also, we wanted the ability to really personalize or customize our assortments to the various customer segments that we had visiting us on the Web site.

My desire is, as we learn more and more about our customers on the Web, [we'll] then translate that into our brick-and-mortar stores. The system to transfer that knowledge is not in place yet.

Q: What else is planned?

A: The [company's] underlying core systems . . . have to be addressed as well, and we're looking at making that a major focus in the year 2000. Looking at the enterprisewide system and all of the transactional and supporting infrastructure would be a new initiative that we will be advancing.

IT played a very important role initially in the company. The original staff brought a solution here that was basically a turnkey solution. Over the years, those systems have not served the company well — have not kept pace with the growth of the company. ◗

Web Success Boosts Customer Expectations

Capacity for greater personalization drives content management demands

BY JULIA KING

Online success sometimes brings unexpected consequences.

Take the case of Home Depot.com, which discovered that educating customers online changes the kind of service they need in stores, according to Mike Anderson, vice president of information services.

Tougher Questions

"If you're giving more information to consumers online and educating them before they get to the store, that means they're asking the really tough questions when they get to the store," Anderson said.

For example, visitors to the company's Web site have access to online calculators that let do-it-yourselfers accurately figure the materials they'll need for a project like wallpapering a kitchen.

E-COMMERCE

So Home Depot is now providing advanced training to help in-store service people answer the tough questions customers bring in, he said.

Unexpected popularity can also be a problem. Within six months of its 1998 launch, American Airlines Inc.'s redesigned Web site was racking up some impressive numbers.

Thanks to new personalization technology, more than 1 million frequent fliers had clicked on *www.aa.com* to check their account status. Another 2 million people had signed up to receive weekly e-mails about low last-minute fares to their favorite destinations.

"Customer enthusiasm for the new site surpassed anything the airline ever anticipated," touted a press release early this year.

Yet internally, the site was drowning in its own success. The airline's eight-person Web publishing group couldn't keep up with customers' demand for personalized content.

"The advent of personalization drives additional challenges for content management," which the Web team didn't see up front, said John R. Samuel, American Airlines' vice president for interactive marketing.

Greater Effort

"With personalized information, we can make customers happier than ever before," Samuel said. The team underestimated the effort it would take to keep new, customized information flowing into the site. So they recruited workers in virtually every other department to write copy to post to the new Web site.

But not all potential consequences of online success lie below the water line. Experts say that some, such as turf wars between a company's real-world and online ventures, are predictable — and preventable with some up-front policy setting.

For example, many retailers, including Nordstrom Inc., sell their products both online and in stores. But if online shoppers can't find what they want online, they're referred to an in-store salesperson. The question becomes where the sale should be credited — to the store or to the online venture?

To solve that problem, more retailers with dual channels will adopt activity-based costing to identify how much they spend on marketing and other functions and where costs should be applied, said Tim Harmon, an analyst at Meta Group Inc. in Stamford, Conn. ◗

*Price shown refers to U.S. estimated selling price for the Armada M700 (part number 149207-002). Actual reseller prices may vary. **For hard drives, GB = billion bytes. †24X Max CD-ROM data transfer rates may vary from 150 KB/s to 3600 KB/s. Operating system installed. Intel, the Intel Inside logo and Pentium are registered trademarks of Intel Corporation in the U.S. and other countries. Compaq, the Compaq logo and Armada are registered trademarks and Better answers is a service mark of Compaq Computer Corporation. ©1999 Compaq Computer Corp. All rights reserved.

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PHOTOS BY JOSEPH E. MAGLITTA

CAPTURING CUSTOMER ATTENTION at live events requires dramatic flair, as demonstrated here by e-commerce vendor Beenz.com

Woodstock '99: Think E-Commerce, Dude

Companies are using live events such as the 30th anniversary bash to leverage the Web and IT in ever more creative ways

BY JOSEPH E. MAGLITTA

NOW THAT the smoke has cleared, it's tempting to dismiss Woodstock '99 as an ugly premillennial carnival worthy of Mad Max.

But, dude, wait.

Strip away the fiery finale and rap/metal mayhem and you'll discover some very creative ideas for using the Internet for business.

Seriously.

While the 30th anniversary music and art festival will probably be best remembered as the dawning of "The Age of Precarious," Woodstock '99 also suggested several ways businesses can create and use live events to drive traffic (and sales) to their Web sites. Among them:

- Use the Web to build disposable "insta-partnerships" before, during and after an actual terra-firma event.
- Bring free, temporary, portable information technology to the people.
- Conduct broadband Webcasting.
- Do your online thing off-line.
- Think "hidden technology."

WHEN THEY'RE NOT DRUMMING, today's neo-pagans expect cutting-edge Internet, computer and telecommunications to serve their entertainment desires

In contrast to the rain-soaked 1969 version, Woodstock 3.0 was saturated by online and off-line marketing messages from dozens of corporations. Planes dragging Lycos banners buzzed overhead; dusty BMX bike racers on dirt tracks flew by with bright Compaq Computer Corp. banners. Even the Oneida County, N.Y., and Mohawk Valley development authorities got into the promotions act.

But by far the best dealsmanship took place on the Web.

Weeks before the July 23-25 event, the official site (*www.woodstock.com*) was crowded with eager "friends and sponsors." The global site, available in six languages, featured links and deals with, among others, Ticketmaster (festival tickets, $150), Amazon.com (collectibles auction), Borders, Columbia House, Sony Playstation, Ace Hardware, Kodak (psychedelic digital pictures), First USA (Woodstock Platinum MasterCard), Aria.com (instant 0% Woodstock Visa), always.com (skin protection products) and numerous emerging Web audio and video companies.

Here's a quick sampling of other ways event organizers smartly leveraged the Web:

BEFORE: Ticket information; artist features and profiles; rumor-quashing; what-to-bring checklists.

DURING: Weather and traffic reports; live Webcasts; photo archives.

AFTER: Promos for a Barenaked Ladies Webcast on July 30; a 15% discount on the new DVD release of the *Stop Making Sense* video screened at Woodstock by the Independent Film Channel; and, of course, a plug for the official *Woodstock 99 Live Album and Video*, due this fall.

THROUGHOUT: Photo gallery; archives; merchandise for sale; free e-mail; message board; chat room.

Chat proved especially interesting. Post-event discussions yielded a nonstop stream of raw customer feedback of great potential value to business and technology leaders. Sample: "I didn't have any schedule of the bands, so I missed a lot of my faves due to guessing at times and having to walk miles to get to the stages. That really sucked!"

Off-Line Action

Interesting e-commerce-related action also took place offline. Audio Book Club Inc. used the event to launch its *www.mediabay.com* portal. The new service offers live audio and video feeds of content and e-commerce. Chairman

EVEN WITHOUT ARSON, rioting and looting, promoting your company's online business and services at live events like rock concerts can be messy business. Send your most creative team

Norton Herrick gushed about the "ability to reach millions of potential new customers through the variety of publicity before and during this monumental event."

Music retailer Trans World Entertainment Corp. (TWEC) also stepped into the event spotlight. TWEC announced a 19.9% stock buy in Woodstock Broadcasting Network Corp. The plan, explained TWEC boss Albert Higgins: Use content from *www.radiowoodstock.com* to drive international traffic to his company's Web site, *www.twec.com*. The deal will be promoted at the company's brick-and-mortar outlets around the world. Said Higgins, "This is an exciting opportunity to marry retail stores with cross-marketing and branding on the Internet." The stock deal gives Woodstock Broadcasting more money to get fresh content into the pipeline.

Whether *www.woodstock.com* survives remains to be seen. But this much is already clear: Insta-sites built around events, disposable or not, give Web-savvy business and technology leaders another potentially powerful tool.

Cash and Info

The longest lines at Woodstock '99 weren't for pizza, henna tattoos, naked showers (a.k.a. the Shag Aquarium), free hemp brownies (sickeningly sweet, awful) or Porta-Potties. They were for e-mail and automated teller machines.

At any moment during the four-day festival, hundreds of pierced and sunburned Gen X, Y and Z'ers stood in scalding sun outside the 24-hour Cyber Lounge tent.

Inside the dark, cool tent, revelers tapped away at any of 100 PCs on a temporary T1 line to zap personal "I'm at Woodstock!" e-mails. Some loungers lingered to check demos by Silicon Graphics Inc. (screaming workstations; open source code); Creative Labs Inc. (new Lava video plug-in for MP3 and new Nomad portable MP3 player); AMP3.com and 21E Web Network Inc. (live broadband Webcast); Magix Entertainment (audio and video creation software); and Beenz.com (e-commerce tokens). Note how each offering is calculated to stoke Web traffic and product demand.

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NO CHEESY WEBCASTS HERE: Two professional satellite trucks beam nonstop global broadband

No matter that Friday night, foul-smelling rivulets of rain-soaked human waste seeped into the tent, closing operations until cleaning crews finished disinfecting. At 10 a.m. Saturday, the lines were back up, right until Sunday night's flaming finale.

Wendy Allen, AMP3.com's director of operations, says it took her team, including information systems director Douglas Cornell, about a week to create the large Cyber Lounge from scratch. (And remember, that's on a rural and semi-deserted former air base.) "We're taking Woodstock into the 21st century," she beamed.

To be sure, this was no Comdex at Woodstock '99. Pot smokers outnumbered e-mailers by, I don't know, say 1,000 to 1 (though some overlap was inevitable). And, yes, rampaging rowdies later bashed the brains (and bucks) out of several ATMs and carried off another.

Still, putting temporary technology where people gather is a small but doable and important step toward pervasive public computing. It legitimizes the question: Does your company do events at which e-mail, Web, satellite, kiosk or ATM access makes sense? Should you sponsor a Cyber Lounge of your own?

Think of other possibilities: Online insurance sales at a motorcycle show, for example.

One of the most impressive technological feats at Woodstock '99 was an around-the-clock, broadband global Webcast. The netcast was calculated — you guessed it — to drive Web traffic and e-commerce sales to organizer AMP3.com and its partners.

We're not talking about the usual cheesy Webcast setup, typically a couple of PCs and a Web cam. No, the goal here was "bring television to the Internet," said Rick Davis, CEO of 21E Web Network. Live feeds from the Nashville start-up supplied continuous, commercial-quality broadcasts to *www.woodstock.com*, sponsor *www.amp3.com*, pay-per-view on DirecTV and other major satellites.

Here's how: Two production trucks from Digital Storage & Media Networks in Atlanta transmitted a digital signal via satellite to Nashville where it sat on 5.6 petabytes (!) of storage. There, it got compressed on industrial-strength television equipment and was sent digitally as high-quality video via broadband fiber.

21E Web Network used the event to show off its own technology before launching its new interactive broadcasting service in the fourth quarter. Interesting for 21E Web Network, for sure (especially if, say, a major network decides to buy it out.) But for the average technologist or business leader, there's also a clear signal: Forget rinky-dink 28.8K and 56K bit/sec. Webcasts because broadband Webcasting is shaping up faster than you think. Start thinking of public and internal applications, like training, now.

I know, this sounds like a convoluted path back to . . . brick-and-mortar stores. And it can be. But answer me this: How do you get people to use an online service if they're not already online?

Liking IT

If there's one more subtle takeaway from Woodstock '99, it might be this: These hip-hopping, foul-talking young Sybarite ravers might not be into the Web or computer technology per se. But they definitely like what technology does for them (even if they don't know it's there).

The coming generation of consumers and workers wants technology — from the multiple computer consoles needed to run a decent rave to the sophisticated gajillion-watt sound systems at Woodstock to the ability to easily buy cool CDs online or download MP3 tracks to playing Quake or other multiplayer worldwide games — that silently and effortlessly serves them, not vice versa. It's probably true now in your business and will become only truer as time moves on.

Don't think Woodstock. Think *Jetsons*. ▶

MOREONLINE

For the original, longer version of this story, plus links, visit our Web site.
www.computerworld.com/more

ATM
Available Inside

THE LONGEST LINES AT WOODSTOCK '99 were for mobile ATMs and two nearby Cyber Lounges, where show-goers could send e-mail and see cool product demos

SEC Fines Brokers for Missing Y2K Deadline

Disclosures due a year ago

BY THOMAS HOFFMAN

In its latest round of year 2000-related disciplinary actions, the Securities and Exchange Commission (SEC) has fined four brokerages a total of $170,000 for failing to file full Y2K disclosure reports on time.

The firms were among 37 brokerages charged by the SEC last October for failing to file all or part of their year 2000 status reports. A lawyer who represents two of the brokerages — New York-based J. W. Barclay & Co. and Stonegate Securities Inc. in Dallas — said he believes the $50,000 fines assessed against his clients for filing their reports late are "excessive, arbitrary and wrongful."

Under SEC requirements, brokerages with more than $100,000 in net capital were required to file two Y2K disclosure forms (a fill-in-the-blanks form and a narrative form) by Aug. 31, 1998. According to a document of the SEC's administrative proceedings obtained by *Computerworld*, the SEC didn't receive Part II of Stonegate's disclosure until Oct. 5. Another firm that was fined — V. B. C. Securities in Clifton, N.J. — didn't get Part II of its disclosure form to the National Association of Securities Dealers Inc. (NASD) until "on or after Oct. 7," according to the document.

A fourth firm, William Scott & Co. in Union, N.J., was fined $20,000 for failing to file the required forms. According to the document, Joseph W. Glodek, president of William Scott, claimed to have faxed the disclosures to the NASD.

The SEC may take further actions against wayward brokerages before year's end. Last month, the SEC approved a rule that allows it to shut down brokerages or transfer customer accounts to other securities firms if the firms haven't verified completion of their Y2K projects by Nov. 15.

Executives for the four firms blamed the late filings on everything from miscommunication with colleagues to fax problems. In her decision, SEC Judge Brenda Murray said the brokerages violated the SEC rules "for no good reason."

Paul Bazil, an attorney at Washington-based Pickard & Djinis LLP who represents Barclay and Stonegate, said he believes his clients were singled out unfairly. He pointed to dozens of other brokerages that were fined a maximum of $3,200 by the NASD's regulatory arm last October. Bazil said both firms are Y2K ready and will likely appeal the SEC's fines. The firms must file an appeal before the end of this month. "We're still not sure" whether we'll appeal the SEC's actions, said Edwin Buchanan "Bucky" Lyon IV, a principal at Stonegate.

A spokesman said the SEC's actions are in line with the agency's charter to protect investors' interests. The SEC, which was heavily criticized for what some said were lax Y2K disclosure requirements before a July 1998 revision, "seems to be more proactive than ever before," said Stephanie Moore, an analyst at Giga Information Group Inc. in Cambridge, Mass. ◗

MOREONLINE

For resources related to year 2000 disclosure such as articles and publications, visit our Web site.
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ED YOURDON

Y2K's nastiest work

Y2K CONTINGENCY planning is hard work, and your business users will need all the help they can get. It's not hard just because it forces people to confront unpleasant scenarios that they would prefer to ignore. It's also hard because the people doing the planning are often the same ones who were involved in the year 2000 remediation. It's hard because people think of Y2K failures as all-or-nothing scenarios. And it's hard because people assume that Y2K problems won't occur until midnight on Dec. 31.

One difficulty involves the people who typically lead the contingency planning effort. Suppose the question is raised: What happens if the billing system is down? The Y2K team member assigned to the finance department is likely to shout, "That can't happen! We've tested it! It's compliant!"

The contingency planning group should assume that *all* systems *could* fail; but that's a difficult mind-set for someone who has spent the past year doing everything possible to prevent the system from failing. If the entire team has this kind of mental block, the contingency plan is likely to focus only on the external systems (for example, utilities) over which the team has no direct control. Make sure your team has at least one or two members who were *not* involved in the remediation effort and who tend to have a pessimistic view of IT systems. Auditors, quality-assurance specialists and security experts are good candidates.

Contingency planning is also difficult because planners sometimes assume that all failures are permanent. But that's rarely true. In some cases, the failure can be repaired in moments (for example, by rebooting a desktop PC); in many cases, it can be repaired within two to three days. Of course, there is the possibility of a monthlong or yearlong disruption, and the contingency planners need to address those scenarios, too.

> *The planning group should assume that all systems could fail.*

But the first question is: "Would anyone in the organization even notice if the XYZ system was unavailable for a few minutes?" Chances are they'll shrug. Then you can ask, "How serious would the impact be if the XYZ system was down for a few days? Would we go bankrupt?" In many cases they've *already* experienced outages of two to three days and have already found ways of coping with the problem. It's only when you reach durations of a few weeks or a few months that users become visibly nervous about the prospects of keeping their business processes operating in some acceptable fashion.

Finally, remember that some contingency-planning scenarios may actually occur before Jan. 1. That means that contingency plans have to be finished substantially before that date and such things as war rooms need to be in place. Y2K project teams are already familiar with some of the "trigger" dates that could cause such problems — for example, the Aug. 22 rollover date for the Global Positioning Satellite system. But consider also the impact of anticipatory policy decisions on the part of business and industry. The U.S. government has announced, for example, that on Oct. 1 it will publish its list of "risky" countries. That may lead to pre-Y2K restrictions on air travel to those nations. Similarly, contingency planners should assume that civil unrest might occur during the final few days of the year. What will you do, for example, if your corporate headquarters is inaccessible because the police have outlawed vehicular traffic into and out of the region? Don't think it can happen? Ask the Broadway theater owners in New York. They may already have been ordered to close their theaters for New Year's Eve.

None of these difficulties is insurmountable, but they do require some pragmatic, "out-of-the-box" thinking. Start now, because it will be too late to do so on Jan. 1. ◗

Yourdon heads the year 2000 service at Cutter Consortium in Arlington, Mass. Contact him at www.yourdon.com.

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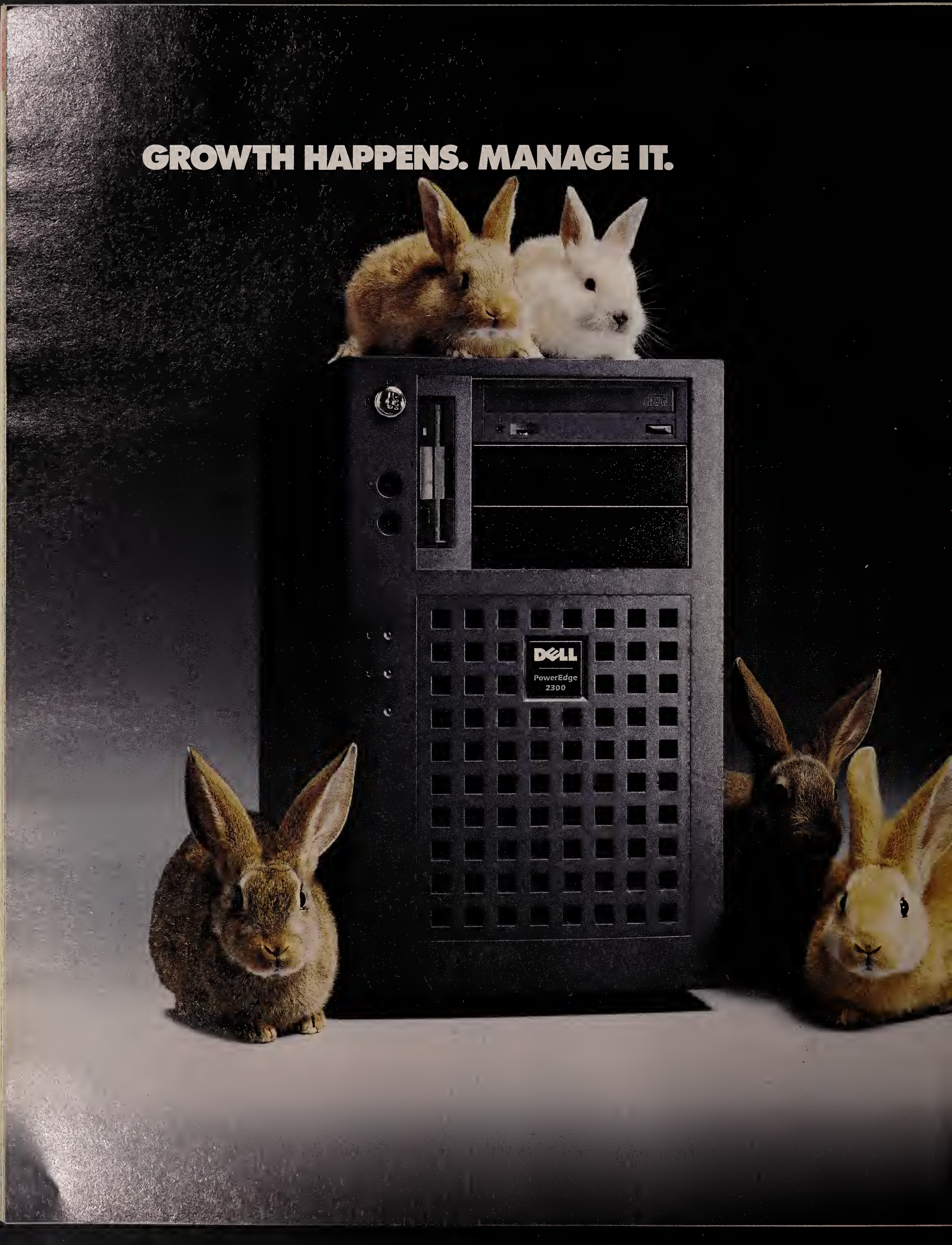
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WHAT'S NEXT FOR

INSTALLING an enterprise resource planning (ERP) system to fix year 2000 problems is pretty much a thing of the past. And for more companies, using ERP software to improve internal efficiency is a ho-hum case of been there, done that.

So now, many users — especially in the manufacturing industries that were the first to latch on to ERP — are moving ahead and looking for ways to better capitalize on their investments.

Their new goal isn't just to modernize corporate systems and cut costs. Increasingly, priorities are shifting toward add-on projects that extend ERP beyond the back office to improve sales, customer satisfaction and business decision-making.

For some companies, that means trying to use their ERP systems to support new e-commerce applications. Others are moving to install customer relationship management and advanced planning software that will be fed data by the ERP backbone they've labored to put in place.

"The people in my organization are saying that it's good we've put this [ERP] foundation under us, but now it's getting fun again," says Jim Prevo, CIO at Green Mountain Coffee Inc. in Waterbury, Vt. "It's time to start reaping the rewards."

Until recently, the coffee maker's chief concern was getting off the old minicomputer applications it had outgrown.

It just swapped in similar configurations of PeopleSoft Inc.'s finance, order-management and manufacturing software without worrying about turning on any bells and whistles — a strategy that was expected to provide "very marginal" returns at best, Prevo says.

Now, the bells and whistles are coming front and center. This summer, Prevo says, Green Mountain Coffee plans to start testing a PeopleSoft-based e-commerce system that will let stores and coffee shops place orders online.

It will also look closely at new business analysis applications that Pleasanton, Calif.-based PeopleSoft is developing. Senior executives are pushing for help in figuring out "who the good customers are and which ones are costing us a lot of money," Prevo says. "We can analyze gross margins very easily now, but we really want to go to the next level."

Those kinds of applications "need a well-designed ERP backbone to make them work," says Joshua Greenbaum, an analyst at Enterprise Applications Consulting in Berkeley, Calif. "There are lots of reasons why you want to install an ERP system. Direct and measurable returns are only one of them."

The same kind of business and technology transition is taking place at Rockford Corp., a maker of audio equipment in Tempe, Ariz., that has been using Oracle Corp.'s ERP applications since 1995.

Most of the emphasis so far has been on improving back-office operations, says David Richards, vice president of information technology at Rockford. Inventory forecasts are much more accurate than before, and the 10 days that the company

CIO JIM PREVO and Green Mountain Coffee are ready to reap the riches of its ERP system by adding e-commerce capabilities and business-analysis applications

ALAN JAKUBEK

ERP?

Y2K is just about done, and streamlining the back office isn't enough. Now, IT organizations are looking to reap more value out of ERP in sales, customer service and business planning

By Craig Stedman

once needed to close its books each month have been reduced to about two and a half.

But now, Rockford is trying to extend the ERP system in ways that will help distinguish it from rivals. "After a while, you have to look at what kind of competitive advantage you can create," Richards says. "It gets to the point where you can't cut [product] costs any more."

Like Green Mountain Coffee, Rockford is working to tie its ERP system to new Web-based applications that will let customers configure products and schedule repairs online. And this month, Richards says, it's due to start using the ERP software to feed Oracle-developed analysis software that's expected to help executives track operations more closely so business plans can be changed on the fly.

Both Prevo and Richards say the new projects aren't expected to have a big impact on their IT staffs. But there will probably have to be changes on the business side of each company. Rockford expects some turnover among business managers in order to bring in executives with a more analytical bent, Richards says. And Green Mountain will likely add the same kind of workers in departments such as finance and marketing, according to Prevo.

The increased user focus on getting more from ERP comes at a time when analysts are questioning the software's financial paybacks. Meta Group Inc. this spring released a report saying the average ERP project costs more than it returns in measurable financial gains, although the Stamford, Conn., consulting firm says the software's potential value as a corporate information backbone makes the investments worthwhile [News, April 5].

High-publicity decisions to kill or postpone ERP rollouts also continue to dot the landscape. With that as a backdrop, more companies "are recognizing that this is a project that never ends," says Jim Shepherd, an analyst at AMR Research Inc. in Boston. Project teams once viewed as short-lived are being left in place to work on broadening and extending ERP systems, he says.

And some vendors and consulting firms are starting to pay more than lip service to the idea of proving that ERP can produce a bona fide financial return. In the spring, for example, market leader SAP AG announced a consulting service aimed at helping users gauge the potential value of installing its R/3 software.

Other big issues to watch include efforts by SAP and its rivals to make their applications more user-friendly in upgrades due out later this year and to better tailor the software for different vertical industries.

Widening ERP's Appeal

The vertical tailoring is aimed at increasing ERP's appeal outside its manufacturing stronghold, which remains the most likely place to find the software. Computer Economics Inc., in Carlsbad, Calif., said in a June report that 76% of manufacturers already have an ERP system or are in the process of installing one.

ERP hasn't penetrated other markets to the same degree, Computer Economics said. For example, only 35% of insurers and health care companies are running or installing ERP applications now, according to its study. For federal government agencies, that figure drops to just 24%.

But most vendors have seen their new sales of ERP applications hit the wall this year, due in part to the end of the Y2K buying binge. So even the likes of SAP and Oracle are devoting much of their attention to developing the add-on applications users are now calling for.

Extending the core ERP system is becoming a priority for users ranging from chemical maker Elf Atochem North America Inc. in Philadelphia to Pacific Coast Feather Co., a Seattle-based maker of pillows and down comforters.

"We think we're ready for the next step," says Robert Rubin, CIO at Elf Atochem. The company next year plans to start surrounding its SAP R/3 system with advanced planning tools, data warehousing software and other add-on packages, Rubin says.

Deluxe Corp., a St. Paul, Minn., company that prints checks and authorizes credit-card purchases, spent $50 million over the past three years to install SAP's finance and procurement applications. More back-office software, such as SAP's human resources and warehouse management modules, are still being rolled out.

But those were all tactical moves aimed at reducing IT and clerical costs, says John Barton, systems architect at Deluxe. Now, he says, the company is putting together a blueprint for using R/3 more strategically in such areas as customer management and business planning.

Pacific Coast Feather is also starting to look at its R/3 system as more than just a back-office transaction engine. The company wants to tap into SAP's data warehousing software to analyze internal operations and do more unified business planning, says Mari Withnell, Pacific Coast's business applications director.

Until now, Withnell says, Pacific Coast has concentrated on replacing its old systems with similar R/3 configurations that provide more room for growth. But that has left gaps to fill, such as separate planning cycles for the company's sales, finance and manufacturing operations.

"We've done the basics," Withnell says. "But there's a lot more that we haven't looked at yet, and that's going to be our focus for the next year." ◗

MOREONLINE

Before moving ahead on ERP, a few companies are still working on getting their back-office systems modernized. For details, visit our Web site. **www.computerworld.com/more**

2 Moves, 1 Step

Irwin Seating Co. is just starting down the ERP road. But even at this stage, the maker of theater and stadium seats wants to take better advantage of its ERP system by extending the software beyond back-office basics.

Two months ago, Irwin began a fast-track installation of ERP applications and an add-on package for supply-chain planning. The Grand Rapids, Mich., company plans to turn on the combined system next year, with goals of improving internal communications and making its production schedule less rigid.

"I don't think we'd help ourselves as much" by just putting in an ERP system, says John Fynewever, senior vice president of operations at Irwin. "The two together are a much more powerful package."

The ERP applications from J. D. Edwards & Co. in Denver should reduce administrative work and streamline the interdepartmental information flow – important improvements, but not ones that Irwin's customers are likely to notice, Fynewever says.

That's where the planning software from Atlanta-based SynQuest Inc. comes in. More flexible production scheduling is a big need because Irwin's customers often ask to change delivery schedules based on how construction of a new stadium or movie theater is progressing, Fynewever says. With competition intensifying, Irwin's seating plant has to be able to handle those requests. – *Craig Stedman*

Rebellious Consultants

Struggling to hold on to key consultants? Keep struggling. Consultants we talked to say the idea of loyalty to an agency is an oxymoron By Leslie Goff

WHEN A SKILLED computer consultant can choose to work just about anywhere these days, what inspires loyalty to a particular agency? For consultancies, that's the $25,000 question.

With turnover rates at consulting agencies reportedly ranging from 30% to 40%, many companies are sampling the tried-and-true retention techniques of Fortune 500 companies to hold on to salaried and hourly consultants.

Consider these retention efforts:

- Metro Information Systems Inc. in Virginia Beach, Va., is organizing quarterly social outings, like beach parties and basketball games, and maintains condos in prime vacation spots that are available free to salaried consultants.
- Entelligence Inc. in Houston lets its independent 1099 consultants accrue paid vacation time, based on billable hours.
- Analysts International Corp. in Minneapolis pays overtime and awards discretionary performance and project completion bonuses to salaried consultants and hourly contractors.

All three offer an array of insurance and retirement benefits, as well as free computer-based training courses to salaried consultants and hourly contractors. But does any of this matter?

Independent consultants say that *loyalty* and *agency* don't belong in the same sentence, that health benefits are a convenience but not a deal maker, that most agencies don't practice what they preach and that honesty and integrity rank far higher on their wish list than perks like paid time off (see list at left).

"Retention? In my opinion that concept doesn't even make sense when discussing the agency/contractor relationship," says Joe FitzGerald, a Boston-based independent consultant who specializes in back-end Internet databases and applications. In 10 years as a consultant, FitzGerald has never worked for the same agency twice.

"Sure, there are things agencies can do to make me prefer working with them over their competition," FitzGerald says. "But these considerations only come into play when I've been offered contracts by multiple firms for the same rate range."

Full-time, salaried consultants can be as hard to hang on to as independents. They often choose to go work for their agencies' clients. Or they may decide, like Ryan Hart, that if they're consulting, they may as well go solo. After three years at Andersen Consulting, Hart joined a smaller Chicago-based firm. Last year, he converted from full-time, salaried employee to hourly contractor because he saw no point in pledging allegiance to a single agency.

Hart stayed with the same agency so he could keep his current position as a systems architect on a major project at Volkswagen Credit in Chicago. But because he wasn't drawing any significant benefits as an employee, such as training opportunities or a 401(k) plan, he decided he "may as well be hourly because there weren't any real benefits to being full time," he says.

Hart says he has been able to keep his insurance package. But overall, "as an agency, it hasn't met all my desires," he says. When his Volkswagen gig is up, he'll search for the next best contract.

Hart, FitzGerald and other consultants say that even the most innovative of perks don't compensate for the big sins of omission by many agencies: their refusal to disclose client billing rates, their unwillingness to pay independent consultants as 1099 contractors, their reluctance to pay consultants' stated rates and, sometimes, their outright failure to pay them in a timely fashion — or at all.

Despite the efforts of reputable consulting agencies to improve retention among full-time consultants and boost repeat contracts with independents, the lingering perception among consultants is that agencies exist for one sole purpose: to exploit their talents for the highest-possible billable rate and the lowest-possible pay rate.

FitzGerald recalls an occasion when, after two successful interviews with a potential client, the agency told him it had submitted him for consideration at a rate of $48 per hour — less than half his stated $125-per-hour rate. The agency broker argued and refused to disclose the client billing rate, and the deal apparently was nixed. But two days later, the broker called him with an offer of $96 per hour. FitzGerald accepted, despite the ugly negotiations, only because he was enthusiastic about the project.

Even Ryan, who as a former employee had a good relationship with his agency, fell victim to underhanded billing practices. His client informed him that his agency had raised his bill rate, but the agency hadn't cut him in on the increase. When he told his agency he knew about the rate hike, it acqui-

Wish List

What consultants and agency executives say consultants really want:

- To be paid their regular rate without having to quibble over it.
- Fair and honest treatment by an agency with integrity.
- Disclosure of the difference between the pay rate and the bill rate, and inclusion in the loop when bill rates are increased. And when that happens, they want additional compensation.
- A streamlined and ethical recruiting process: They don't want to be sent on countless client interviews; they want approval before an agency submits their name and résumé to a client. They also don't want to be contacted for jobs that don't match their bill rates, skill sets or stated objectives.
- To be paid on a 1099 or business-to-business basis vs. as a W2 hourly temp.
- Compelling, challenging projects.
- Health insurance and 401(k) benefits effective from the first day of work.
- Access to training.

– Leslie Goff

JOE FITZGERALD, a Boston-based consultant, has never worked for the same agency twice

JAY REED

> We don't view our consultants as employees; we view them as our customers.
>
> STEVE SATTERWHITE, PRESIDENT, ENTELLIGENCE INC.

esced and cut him in. Had the client not told him, he never would have known.

Agencies aren't exactly in denial. "It's a foregone conclusion that the salaries they receive must be on a par with what our customers are paying and our competitors are paying," concedes Sarah Spies, executive vice president at Analysts International.

But even agencies that have demonstrated a commitment to building long-term relationships with consultants downplay compensation issues and are reluctant to go on record with the difference between pay rates and bill rates.

When it comes to retention strategies, agencies are more focused on the soft side: providing challenging projects, a solid benefits package and a feeling of belonging.

"We don't view our consultants as employees; we view them as our customers," says Steve Satterwhite, president of Entelligence, a Southeastern regional agency that works almost exclusively with independent consultants. The company, whose clients include Shell Oil Co. and Texaco Inc., offers a full bouquet of benefits, dubbed "The Free Agent Promise." Benefit offerings include health insurance (Entelligence pays 75% of the cost), life insurance (100%), dental insurance (100%), a 401(k) program, six paid holidays and accrued paid vacation.

Entelligence focuses on exciting projects as the big draw. The trump card that keeps consultants on its roster is attention to individual needs, such as advancing cash for a move. The company also assigns a recruiter to free agents, who starts searching for the next big project before their current one ends.

Metro Information Services has also adopted strategies to make its consultants feel like more than just numbers, says Brad Breseman, a vice president at the company. Metro has staff coordinators at each client site who "meet with [consultants] every two weeks so they feel like part of the Metro culture," Breseman says. The coordinators help consultants set career goals and search for their next gigs. The benefits package depends on whether a consultant is full time or hourly, but benefits for both include an employee referral bonus ($6,000 paid out during 24 months) and access to 800 online courses available at the company's staff-only Web site.

Training for new opportunities is at the heart of Analysts International's retention strategy. The company has contracts with two computer training vendors, offers online coursework and reimburses consultants for outside classes, such as certification courses, Spies says. The company also assigns a staff liaison to each consultant: "The staff manager is the ombudsman, presenting the career desires of the technical staff so our [branch] locations can determine what might be possible that meets our needs and their needs," she says.

As for how effective their touchy-feely strategies are, that remains unclear. Breseman says Metro International, which has approximately 2,600 consultants and 42 offices nationwide, doesn't track turnover percentages or return engagements. Full-time staff members, who make up approximately 55%, stay an average of 18 months; hourly independents are usually with the agency about a year, he says.

Spies also doesn't have figures on return engagements by independent consultants at Analysts International. The company has about 4,000 consultants nationwide, both full time and hourly. As for turnover, she guesses, "Oh, about what the average is — about 30% maybe." She says she sees no significant differences in the turnover rate between full-time staff and project hires and adds that it's really a problem only when it results in an interruption of service to the client.

Satterwhite says he loses approximately 50% of his consultants to full-time jobs offered by clients. But he's grown to accept it. "On the one hand, I am losing a source of revenue. But on the other, if they have had a great experience with my company, then we have another ally in that account," he says.

And of the remaining 50%, all but a handful have remained with the agency for repeat engagements.

Consultants, ever the skeptics, say agencies aren't really that concerned with turnover because they are in an advantageous position: Because of the Internal Revenue Service's 1706 laws, most information technology shops are reluctant to hire consultants directly, working instead through a list of preferred agencies to avoid potential scrutiny. In the end, both the client and the consultant lose out, they say.

"The clients don't understand that they may be paying $150 an hour for a $60-an-hour contractor, and that is outrageous," FitzGerald says. "The only one coming out [ahead] in the end is the broker who got the deal." ◗

Goff is a freelance writer in New York. Contact her at lgoff@ix.netcom.com.

AMY WASSERMAN

DULL JOBS BUT GREAT OPPORTUNITIES

BY FAWN FITTER

IN THE WEB-ENABLED, e-commercial, data-warehoused brave new world of information technology careers, job seekers who turn up their noses at less trendy positions may be making a huge career misstep.

Although it may seem that opportunity knocks only on the newest doors, plenty of work is still to be found in more pedestrian but no less worthwhile positions located a bit farther from the cutting edge.

For every Java jockey building the perfect browser-based database interface, there are dozens of traditional systems analysts dissecting code and software developers putting mainframes through their paces.

What's more, they like it that way, says Bill Brannen, director of workplace transformation at Sears, Roebuck and Co. in Hoffman Estates, Ill. "We put the sexy, flashy stuff up on our job-posting system, but the people who are working on the traditional things aren't flocking to apply for [it]," Brannen says. "Some folks really like to work on assembler programming or production support . . . I would imagine most people here don't look at their jobs and think they're mundane."

Need for Traditional IT Knowledge

With 1,700 IT employees and a strong recent push into online commerce and data mining, Sears offers its share of jobs that push the technology envelope. But the company has a much greater need for people who can do security administration, mainframe programming, quality assurance, desktop PC installation and other tasks that fall squarely in the mainstream of traditional IT.

Put together a Web page showcasing the latest appliances? Sure, OK, there might be an opening. Maybe.

Integrate a software package from PeopleSoft Inc. in Pleasanton, Calif., into the human resources department's legacy system? You're hired.

In fact, Brannen says, the backbone of Sears' IT department is the production support staff. All are professionals with at least three years of experience who are on call around the clock in case a line of code needs repair or a table entry needs correction. The job isn't glamorous, but it takes unshakable knowledge of a mission-critical system and the presence of mind to be able to fix a crash at 2 a.m. after being pulled out of a sound sleep by an insistent beeper.

At Ameritech Corp., the one-time Baby Bell turned telecommunications giant in suburban Chicago, 90% of all IT hires go into systems development or systems administration. Those focusing too closely on Web development and e-commerce are severely limiting their chances of getting hired, says Renee M. Schneider, the company's director of staffing for corporate information systems.

Silver Linings

Taking on a traditional information technology position is a trade-off. In exchange for passing up the short-term chance to take on one of the hot new specialties everyone's talking about, you receive certain long-term benefits:

- Traditional IT jobs are the best route to a strong background in basic technical skills, which are the building blocks of any IT career. "Mundane" jobs like coding, analysis and user support paint the proverbial big picture of technical opportunities. It's the equivalent of fulfilling prerequisites before declaring a major.
- Most long-term career opportunities come from development, not from the flavor-of-the-month IT fad. Someone with a broad base of knowledge can always jump to another job or acquire a new skill. But someone who lacks a basic understanding of how IT works as a whole has dug a tidy little career rut.
- Coming up through traditional development ranks can give you a sweeping overview of a particular company or industry. IT employees at Sears, for example, end up in any one of 12 interconnected departments ranging from credit to logistics to customer relations to retail and can branch out into project management, relationship management and general management, in addition to technical work.

At Ameritech, even the most routine development jobs lead to a deeper understanding of the telecommunications business; as the company's Renee M. Schneider puts it, "No matter what we sell, we have to go back to the [information systems] guys . . . to build it, roll it out and make it work." This broader, deeper exposure to a firm or field can help build executive potential as well as technical chops.

– Fawn Fitter

"The vast majority of the jobs we hire for are development jobs, traditional mainframe and client/server programmers through systems analysts," Schneider says. "Right now, out of the 250 job postings we have in IS, only four are groupware and only two are for Web development."

No, you might not be the envy of your friends when you're compiling code while they hop aboard Web start-ups. But when they get laid off five times in six months and you're steadily progressing toward CIO, with plenty of savings in the bank, who'll be more content? ◗

Fitter is a freelance writer in Brighton, Mass.

BUSINESSQUICKSTUDY

FINANCIAL & BUSINESS CONCEPTS IN BRIEF

E-Commerce Strategies

BY JACQUELINE EMIGH

DEFINITION

A business model for generating and sustaining revenue, designed to take advantage of the unique characteristics of the Web. There are a growing number of models and strategies as more businesses get involved in e-commerce every day.

THE WEB is adding new dimensions to conventional business practice and creating new types of business strategies.

For example, electronic business is creating a new class of Web-based middlemen that are displacing some longtime intermediaries like traditional distributors and full-service brokerages. Monster.com, for example, is taking advantage of the Web's capabilities for two-way interaction by linking job seekers with human resources recruiters, says Jeff Taylor, president and CEO of the Maynard, Mass.-based company.

Some of the new middlemen, like eBay Inc. in San Jose, are operating auction sites that use dynamic pricing, a model that exploits the real-time capabilities of the Web to let pricing fluctuate freely based on supply and demand.

"Dynamic pricing is Darwinian, in that you have to satisfy both sellers and buyers in order to survive," points out Evan Schwartz, author of the book *Digital Darwinism.*

In this new world, businesses can be tough to categorize and comprehend.

Gerhard Friedrich, president of Friedrich Associates, a consulting firm in Marblehead, Mass., says he sees electronic businesses falling into two main groups: "dot.com companies and existing companies that are undergoing business transformation."

Dot.com ventures tend to follow one of three types of business models: software start-ups, full solutions and "I've got an idea" efforts, Friedrich says. Roving Software, maker of Constant Contact, software that sends personalized e-mails to Web site customers, is an example of a software start-up. A full solution example would be Boston-based Viant Corp., a provider of complete Web site development. An "I've got an idea" example would be DriverSpace.com in Waltham, Mass., which sells auto parts on the Web at a 15% discount.

Friedrich says companies must take advantage of customer information in their e-commerce models. "Many existing retailers have done a notoriously poor job of utilizing customer information to date. Retailers should be using customer information for continuous learning, not just for transaction processing," he says. "And existing businesses of many kinds still tend to think of the Web as just a new channel, when, in reality, it is going to become their business."

Lee Neubecker, senior product marketing manager for online community products at Lycos Inc. in Waltham, Mass., breaks e-commerce models into the three Cs: "communities, content and commerce. Most e-businesses fall short on at least one of these three Cs," she says, noting that traditional businesses tend to have the hardest time with the idea of community.

Message boards and chat sessions are ways to build communities. Content refers to information conveyed over the Web. News stories and stock quotes are two examples. Commerce is when consumers or businesses pay money to purchase physical goods, information or services that are posted or advertised online.

Haim Mendelson, a James Irvin Miller professor of information systems at Stanford University in Stanford, Calif., uses a grid to compare electronic business models. This grid contains parameters such as type of market (business-to-business, business-to-consumer or consumer-to-consumer); type of product (physical goods, information content or service); and selling environment (cyberspace vs. brick-and-mortar).

Sushil Vachani, associate professor of management policy at Boston University, suggests adding a geographic dimension (international, national, regional) to the grid. Vachani maintains, for example, that Amazon.com Inc.'s recent agreements with existing players in Europe have been prompted by the need to help keep pace at the international level with Barnes & Noble Inc., which is 50%-owned by European-based Bertelsmann AG.

Vachani also cautions that customers can be lured away by sites that offer the same product at a lower price. "After you've poured out millions for marketing, someone else might come in three years later and undercut your pricing," he warns.

To avoid that, companies should "try to produce business models that will prevent duplication by others," he says. One way is to invest so much money that you create barriers to market entry by others. Another way is to keep innovating so quickly that competitors find it impossible to keep pace. ◗

Emigh is a freelance writer in Boston.

Types of E-Commerce Business Models

E-COMM SITE	MARKETS	TYPES OF PRODUCTS	ENVIRONMENT	GEOGRAPHIC
Amazon.com	Business-to-consumer	**Physical goods**: books, music, videos, toys, electronics; **information content**: articles, chats; **services**: auctions, gift services	Web-based	International
Barnes-andnoble.com	Business-to-consumer	**Physical goods**: books, music, videos, software, magazines **information content**: articles, chats; **services**: product recommendations, Northern Light search service	Web-based, brick-and-mortar	International
eBay.com	Consumer-to-consumer, business-to-consumer	**Services**: auction specialist	Web-based	International
CVS.com	Business-to-consumer	**Physical goods**: health, beauty, wellness products; greeting cards; **services**: ordering and shipment of prescription drugs and other products; Kodak photo services	Web-based, brick-and-mortar	National
Drugstore.com	Business-to-consumer	**Physical goods**: health, beauty, wellness products; **services**: ordering, shipment of prescription drugs and other products	Web-based	National
Cisco.com	Business-to-business	**Physical goods**: computer Web-based networking products; **information**: company-related; **services**: international product ordering, distribution	Brick-and-mortar	International
Clockwork Pizza *virtmall.com/cwp/cwpdeliv.htm*	Business-to-consumer	**Physical goods**: pizza, subs, salads, etc.; **services**: delivery to seven Mass. towns	Web-based, brick-and-mortar	Regional
Dianes-gourmet.-com	Business-to-consumer, consumer-to-consumer	**physical goods**: specialty foods; **services**: nationwide food delivery, Internet recipe exchange service	Web-based, brick-and-mortar	National
Etrade	Business-to-consumer, business-to-business	**Information content**: stock quotes, investment information; **services**: financial services	Web-based	International
Fidelity.com	Business-to-consumer, business-to-business	**Information content**: stock quotes, investment information; **services**: financial investments	Web-based	International

Are there business terms you would like to learn about in QuickStudy? Please send your ideas to QuickStudy editor Stefanie McCann at stefanie_mccann@computerworld.com.

MOREONLINE

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LAS VEGAS, NEVADA

idealab!

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THE SPEED AT WHICH COMPANIES ARE SIGNING UP FOR IT.

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JOE AUER/DRIVING THE DEAL

'One easy payment' can be one costly ploy

MANY TECHNOLOGY suppliers today offer one-stop shopping: Equipment, financing, software, maintenance and services all rolled into one payment. While this can be a quick and easy solution, especially in the desktop world, it may turn out to be an expensive solution. Here's why:

When all the components are bundled into a single package price, you don't know the true costs of each. You may overpay for a particular segment of the deal.

Car dealers have developed this seductive packaging technique to a fine art with their one "low" monthly payment, which spares the eager consumer from dealing with the new car price, the trade-in amount, the financing issues, insurance, shipping, get-ready charges and the like. What consumers don't see is how much they're paying for each individual part.

The optimum way to negotiate either technology or cars offered under this sales model is first to recognize that attractive packaging can be very expensive. Then break the package apart and compete, negotiate and optimize each and every component. Make it clear to the packager that you are very willing to acquire on a line-item basis — and that each part has to stand the test of competition.

When you're through, don't be surprised if the sum of the negotiated parts isn't less than the original package price.

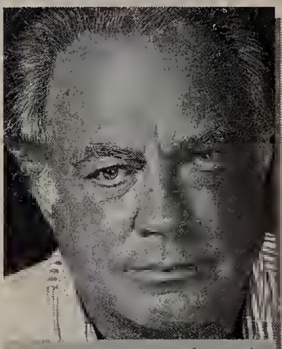
Yet Another Y2K Fait Accompli

The new millennium is ever closer, and it's continuing to create great opportunities for some suppliers. Here's a story that no doubt is becoming quite common, unfortunately:

A national consumer goods company recently contracted for some year 2000 software remediation work. The supplier offered a fixed-price contract. During contract negotiations the supplier balked at providing a Y2K-compliance warranty. The supplier cited "software complexity" and "relationships with external applications" as the primary reasons for being unable to provide one.

The client had little leverage because it was negotiating in June for a four-month project that had to be completed by Dec. 31. Options were also limited because the software wasn't widely supported by third parties, and there were no in-house resources available. Having no negotiating power, the client had no choice but to cave in to the supplier's terms.

Here's the opportunistic part of the equation: The supplier providing the remediation service was also the software developer. Who better to understand the software complexity? This is a great example of a supplier seizing the opportunity, taking absolutely no risk and getting all the money. Sometimes all we can do is not get angry, but get even — by getting a new supplier later.



JOE AUER is president of International Computer Negotiations Inc. (*www.dobetterdeals.com*), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High-Tech Acquisition Professionals. Contact him at **joea@dobetterdeals.com**.

Mailbag

In my July 5 column, I shared the shenanigans of an unscrupulous software vendor conducting highway robbery on an auto manufacturer. Several passionate responses came my way, like the one from Bob, an office manager for a physician — clearly an organization with far fewer financial resources than an automaker.

Bob fell victim to a software company that couldn't make its product Y2K-compliant and sent customers scrambling to buy another product or buy from another source, just one year after their initial purchase.

Bob read the advice, which was: "It just goes to show we must correctly anticipate all of the rights and flexibilities we will ever need and negotiate them into the deal from the start." Bob laments that this is a near-impossible task. As he put it, "Even lawyers, who routinely write software contracts, cannot correctly anticipate all the methods that those who are unethical have at their disposal to screw the rest of us."

His frustration is understandable. Why don't we all let vendors know: "We're mad as hell, and we're not going to take it anymore." ◗

WORKSTYLES

Want To Attract, Retain IT Staff? Then You May Want To Clean Up Your Act

BY STACY COLLETT

RewardsPlus of America Inc. may be on the fast track to success with its online employee benefits business, but a year ago, you couldn't tell by the office space it kept.

The company's bulging headquarters was perched on the 15th floor of a suburban Baltimore building that had a mix of commercial and residential occupants.

Inside, some of RewardsPlus' 45 employees worked in converted closets, and two staff members worked in what was once a weight room. The company's president was banished to a smaller space when five new hires took over his office.

RewardsPlus was feeling the same growing pains many upstarts do, but the cramped, cluttered conditions were taking their toll on employees and company hiring.

"People we wanted to hire were intimidated by the environment, thinking there was no way a company could survive there," said Jamie Spriggs, CIO at RewardsPlus. Employees who were once enthused by the promise of a bigger, neater office grew restless as plans lagged.

Observers say it's common. More than one-third of managers surveyed by office design research company HLW International LLP said recruiting is adversely affected by a space that's disorganized or tired. Some 39% said employee retention is adversely affected by cluttered and rundown office space.

With today's competitive market, "prospective employees, particularly young professionals, are demanding their workplace be conducive to productivity and creativity," said Susan Boyle, senior managing partner at HLW in New York.

Clean Up Your Act!

In a recent survey of 400 managers and employees:

73%	Said their workspace didn't promote productivity
38%	Said recruiting is adversely affected by tired disorganized office space

SOURCE: HLW INTERNATIONAL LLP, NEW YORK

The study also asked 400 employees about their workspace and its impact on their productivity. Nearly three quarters said their workspace didn't promote productivity, 61% said access to well-designed meeting space encouraged better team skills, and half complained their workspace was too noisy and they were often unable to concentrate on work because of it.

Agency.com, a Web site development company in Boston, knows the productivity drain that comes with noisy, uninspired office space.

The company's former digs were "very beige," with a mix of high-walled cubicles that offered "very little chance for natural interaction" peppered among an expanse of workstations with no walls, recalls co-founder Kyle Shannon. "It was too noisy," he said.

This year, both companies moved into new offices they say encourage productivity and help hiring.

RewardsPlus began the new year in a new 30,000-sq.-ft. office in Baltimore's financial district. Office spaces are a mix of quiet work areas and convenient meeting rooms.

The company has nearly doubled its staff, Spriggs said. "IT people are looking for the entire package. They, more than others, go beyond compensation. We really have the total package now," he said.

Agency.com in July moved 125 employees to a roomier office complex in Cambridge, Mass. Walls are low to create an open-space feel and let in natural light.

While it's still too early to measure results, one hire who wavered on joining Agency.com changed his mind when he saw the company's new space, Shannon said.

"Will having a great space definitely make great work? No," Shannon said. "But having a lousy space definitely hinders it." ◗

A WORD ABOUT THE NEW MANAGEMENT TEAM: ATTITUDE

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TECHNOLOGY

TOO MUCH, TOO FAST

PC vendors are fast-tracking basic changes that could create compatibility nightmares for IT. An exclusive survey shows that you like the technological improvements — but would rather phase the changes in slowly. ▸ **68**

SWITCHES SMARTEN UP

A smarter load-balancing switch from ArrowPoint Communications Inc. learns where content is stored on your system, anticipates hot content and speeds Web site visitors to the address they seek. ▸ **62**

Q&A: TANDEM'S JAMES TREYBIG

The founder and former CEO of Tandem knows a lot about what it takes to achieve high levels of application uptime. In an interview, he explains why electronic companies' sites keep crashing and blows holes in vendor promises of 99.99% uptime. ▸ **61**

OUTSOURCE YOUR SEARCH

Emerging Companies: Searchbutton.com offers to index your site and supply search tools for your visitors for little or no money. Has it got competition? Plenty. ▸ **64**

REUSE – FOR REAL

Even with year 2000 and a massive application to develop and deploy, developers at Universal Underwriters Group are investing in component reuse. That investment is expected to pay off soon, when the company deploys an application on which it saved 80 developer-months. ▸ **60**

650 MHz!

Seeking to step out of Intel's shadow, Advanced Micro Devices throws down what it claims is the fastest x86-type processor on the market. Analysts agree the chip is a flamethrower but say the real test lies in AMD's execution. ▸ **61**

FORMS ON THE HOOF

The Holstein Association tracks (what else?) cows at 25,000 dairy farms. That means 600,000 forms each year — most of them filled out by hand. To prevent udder chaos, the group uses an optical character recognition tool from Microsystems Technology. ▸ **60**

READY FOR BROADBAND?

Commentary: James Connolly writes that as consumers taste broadband at home, corporate Web site managers had better start preparing. Users will be spoiled by the download speed and persistent connection. Are you ready? ▸ **62**

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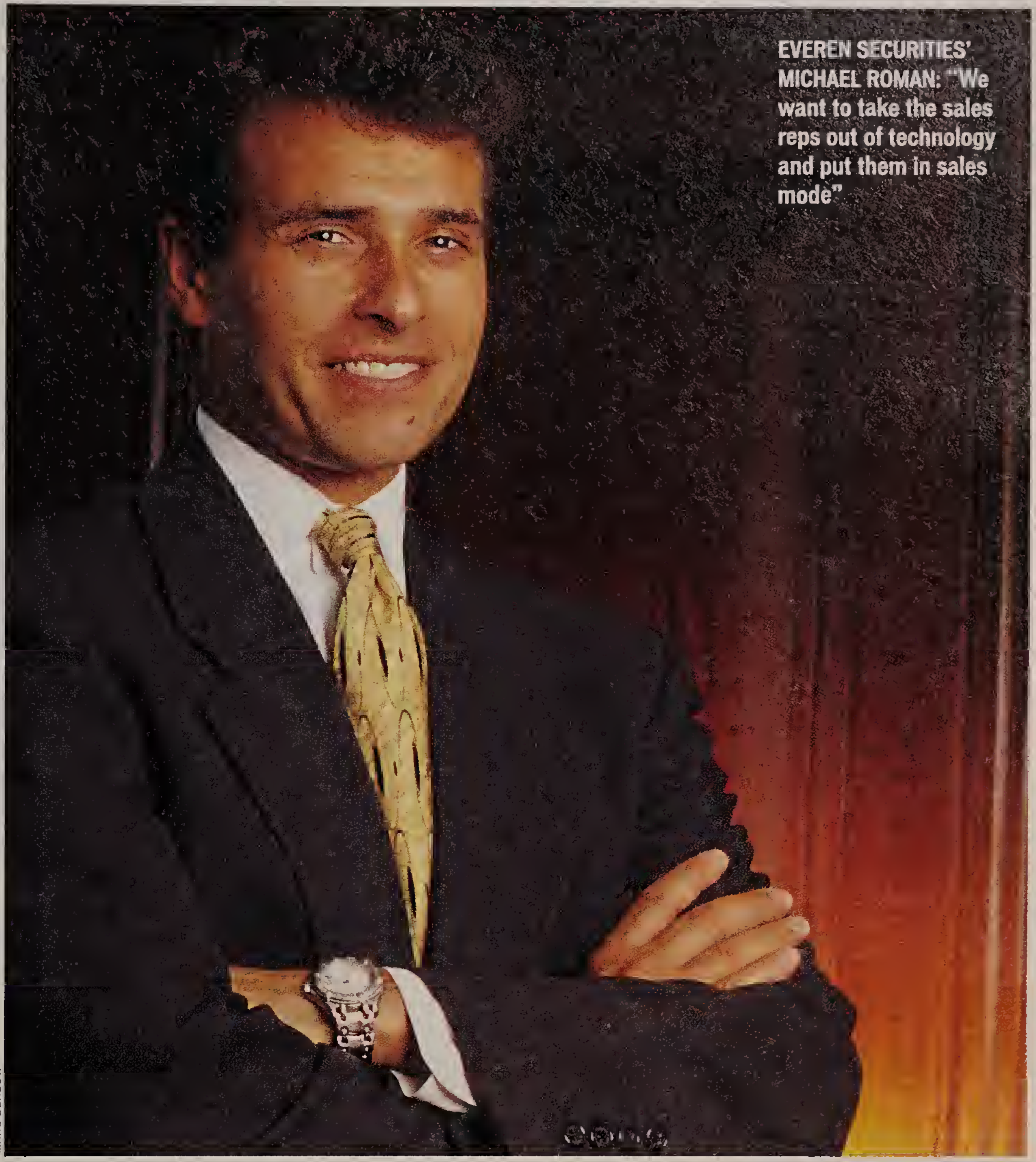


EVEREN SECURITIES' MICHAEL ROMAN: "We want to take the sales reps out of technology and put them in sales mode"

MARC BERLOW

PUT CUSTOMERS FRONT & CENTER

IT managers who thought they were implementing sales force automation packages report that what they really needed — and are now working toward — are true customer relationship management systems. That means having a broader range of data available to teams of users at all times.

70

BRIEFS

Web Expense App Works With R/3

Solix Internet Inc., a start-up in Santa Clara, Calif., has released a Web-based travel and expense management application that can be tied to SAP AG's R/3 software and other enterprise resource planning (ERP) systems. The self-service package runs on Windows NT and Solaris servers and lets users process expense reports online, Solix said.

Pricing for the package starts at $250,000.

www.isolix.com

Software Automates Parts Sourcing

San Francisco-based start-up Supplybase Inc. has released supply-chain software that automates the process of sourcing custom parts used in high-tech products such as computers and medical devices. The application runs on a central Windows NT or Solaris server and lets manufacturers deal with parts suppliers via e-mail and Web browsers. Links to a global directory of more than 25,000 suppliers are provided.

Pricing for the software starts at $260,000.

www.supplybase.com

Marcam ERP Upgrade

Marcam Solutions Inc. in Newton, Mass., has announced an upgrade of its ERP software for process manufacturers. The upgrade includes new activity-based costing and budget analysis modules. Protean 3.1 also runs on the IBM AS/400 and has expanded support for managing product returns and order transfers.

Pricing for the upgrade starts at $100,000.

www.marcam.com

Windows Text Editor

Helios Software Solutions in Longridge, England, has released TextPad Version 4.0, a Windows 98/95/NT text editor. The new release features color syntax highlighting for C/C++, HTML and Java and free add-ons for Perl, AutoLisp, Pascal and other languages.

The software costs $27.

www.textpad.com

Real-World Reuse: Insurer Sees Components Pay Off

Estimates early adoption will save 100 months of developer time

BY DAVID ORENSTEIN

EVEN with year 2000 and a massive application to develop and deploy, developers at Universal Underwriters Group (UUG) in Overland Park, Kan., are willing to make a burdensome investment in long-term efficiency.

But that investment is expected to pay off soon, when the company deploys an application on which it saved roughly 80 developer-months — thanks to reuse. "We began to reorganize our entire department to enable reuse last year," said R. G. Eaton, director of the solution support center at the specialty auto insurer.

New Philosophy

Reorienting a development team to develop code that can be reused in future projects is rare in corporate information technology, analysts said. "A lot of companies are taking stabs at it," said author and consultant Paul Harmon, who edits the "Component Development Strategies" newsletter. But only about 3% to 5% of corporate IT shops fully embrace the discipline, including the new development philosophy and roles it requires, he estimated. "You're talking about changing the whole culture," Harmon said.

Reuse Recipe

Universal Underwriters Group's new property and casualty insurance system made substantial use of reuse:

Lines of generated code	21 million
Total components	30
Number of reused components	10
Estimated time saved from reuse	80 months*

* Developer time

Rather than churn out lines of ad hoc code to finish a project, Harmon said, organizations focused on reuse must analyze the business to find overlapping application needs that the same components could address. Each component must be as flexible as possible. Many companies dare not risk lengthening their development cycle.

Teamwork

But convinced of the value of reuse, UUG asked Toronto consulting firm Castek Software Factory Inc. to help overhaul its development team structure to achieve reuse. New teams will find and acquire reusable components from the outside world; harvest them from in-house efforts; maintain and enforce reuse processes; plan and manage the enterprise's software architecture; classify and certify reusable components and processes; test code performance and quality; and support the use of development tools.

UUG expects to reap the benefits of its early adoption of component-based development, which began in 1995, when it deploys a massive client/server version of a once mainframe-only application in October.

About one-third of the application, which has more than 21 million lines of generated code, is composed of reused components (see chart). UUG wrote applications in two years using Dallas-based Sterling Software Inc.'s Cool:Gen, which allows developers to design components and generate the underlying code. ▶

Scanning Technology Outstanding in its Field

Group uses optical technology to track Holstein cows at 25,000 dairy farms

BY DOMINIQUE DECKMYN

The Holstein Association USA Inc. tracks Holstein cows at 25,000 dairy farms across the country. That means handling 600,000 forms each year — most of them filled out by hoof (OK, by hand).

Every time a new Holstein calf is born, the farmer fills in a form that lists birth date and the names of the parents. Despite attempts to get dairy farmers to send in the forms electronically, about 80% are still on paper. The others are entered via the organization's file transfer protocol site or are mailed on diskette.

To expedite the record-keeping process, the Holstein Association two years ago started using OCR for Forms from Tampa, Fla.-based Microsystems Technology Inc. OCR for Forms is an optical character recognition (OCR) tool that scans both machine- and hand-printed text. The Brattleboro, Vt.-based association also considered competing software from Datacap Inc. in Tarrytown, N.Y.

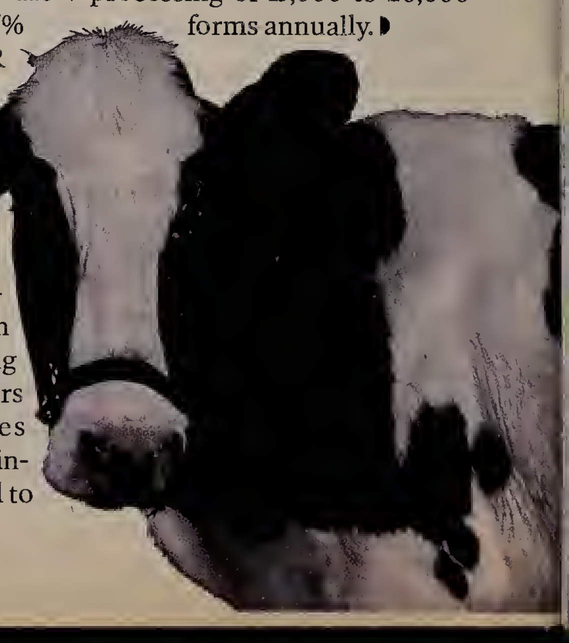
How It Works

Information lifted from the forms is stored in a 60G-byte Informix Corp. database. The scanned forms and digitized pictures of the cows are stored in ApplicationXtender, an archiving system from Online Technologies Group Inc. in Bethesda, Md., for identification purposes — the variations in Holsteins' signature black spots are as unique as human fingerprints.

The system was a $200,000 investment and paid for itself in the first year, said Rick Cronce, executive director of information systems at the Holstein Association. Scanning, verifying, indexing and archiving the forms now requires about 12 people, nine fewer than needed for manual processing, Cronce said. He said the company gets 85% accuracy from the OCR technology.

Other data about the cows is gathered by 50 workers who venture out to dairy farms to rate animals on about 15 traits (such as height and width) using rugged handheld computers from DAP Technologies Corp. in Tampa, Fla. The information is then uploaded to the Informix database where it is used to predict the future production of a given animal. It will also help farmers locate an ideal sire for a specific cow by running special algorithms against the database.

The association is now evaluating automated processing of other forms, such as those used for blood typing and embryo transplants. Though there are fewer forms to process, Cronce said the Holstein Association "can now see payback" for automating the processing of 15,000 to 20,000 forms annually. ▶



Web's High-Availability Issues Create Challenges

Interview: Tandem founder James Treybig says he scoffs at claims of 99.99% uptime

AS FOUNDER and former CEO of Tandem Computers Inc. — a vendor of very high-availability systems and now a Compaq Computer Corp. subsidiary — **James Treybig** knows a lot about what it takes to achieve high levels of application uptime. Today, he's a partner at Austin, Texas, venture capitalist Austin Ventures and invests in high-tech start-ups.

Treybig recently spoke with *Computerworld* senior editor Jaikumar Vijayan about high-availability issues on the Web.

Q: What are some of the biggest challenges companies face in building reliable, scalable Web environments?

A: Ensuring data integrity. The hardest problem is making sure that when something fails, you don't lose data. For many companies, as long as you can get back on the air quickly, failure is OK if you can do two things: a [system] dump to find out what caused the problem, and [making sure] no data got corrupted. Failure always raises the problem that you lose data. . . . Over time, it's like cancer in your database. . . . You have a huge crash, and you can't recover any data.

JAMES TREYBIG knows what it takes to achieve high levels of application uptime

Q: There has been a spate of high-profile service outages recently. Why?

A: Some of the companies doing e-commerce are new ones. They start without much money and without having a way to address all these issues. They build systems; they explode; they build them again. They don't have good application testing; they don't do failure analysis; they don't do stress tests.

Then you have the brick-and-mortar companies who have been around a long time — but not necessarily online. When you look at e-commerce, your business revolves around the Web. That means changing systems, upgrading them, doing new software releases. . . . These are all problems.

Q: So what should companies do?

A: Fault tolerance is like having a dial tone. You can't look at only the [hardware] system anymore. The architecture of the whole complex is really key to availability, reliability, scalability and data integrity.

Q: Isn't that expensive to achieve?

A: It is not. You want to be cost-effective. You may have all your databases on Unix boxes, you may be running your applications on NT boxes. You can partition your data over lots of systems that are reliable so that if something fails, you don't lose data . . . or you have duplicate data running on separate systems. . . . The architecture of the site is how you achieve this, not individual systems. What mattered in the old days was having one system that was scalable, reliable, etc.

Q: A few vendors are saying they might soon be guaranteeing better than 99% availability on their Unix boxes.

A: I don't believe that for a second. There is a kind of naïveté when people talk of things like 99.99% uptime and fault tolerance — you know it's not possible. There is no stand-alone Unix box that is anywhere near 99.99% availability — and there is no NT box for sure.

If you don't have underlying box, database and application protection, you are not going to get anywhere near that. ▸

AMD Launches Lightning-Fast PC Chip

Targets workstation and server markets for new revenue

BY JAMES NICCOLAI

Advanced Micro Devices Inc. saved a surprise for the launch of its Athlon processor last week: a 650-MHz version that AMD claims is the fastest x86-type processor on the market.

Athlon, formerly known as the K7, initially will be sold in high-performance desktops. But over time, the chip maker hopes the new processor will bring in revenue from the more profitable workstation and server markets.

IBM and Compaq Computer Corp. will be the first big-name vendors to release Athlon desktops later this month or early next month, an AMD spokesman said. Prices are expected to start at about $1,300 for a 500-MHz Athlon PC, increasing to more than $2,000 for PCs using the fastest chip, AMD said.

Faster Than Pentium III?

Some analysts said Athlon is faster than an Intel Corp. Pentium III processor running at the same clock speed.

At 600 MHz, the AMD chip was up to 14% faster than the Pentium III in a handful of benchmark tests conducted by Scottsdale, Ariz.-based Mercury Research Inc.

While analysts said AMD has designed a humdinger of a processor, they cautioned that its success depends on the company's ability to bring Athlon to market without any significant manufacturing hiccups — something the chip vendor has struggled with in the past.

"With AMD, the question is never, 'Can they design a chip?' The question is, 'Can they manufacture it in huge volumes, and can they do it on time?' " said Tony Massimini, chief of technology at Semico Research Inc. in Phoenix. ▸

Niccolai writes for the IDG News Service in San Francisco.

IBM Unveils Notebook Hard Drive

BY JEFF PARTYKA

Notebook PC users on the go can now take 20 television-quality movies or 792 feet of shelved books with them, thanks to a 25G-byte hard drive announced last week by IBM.

The company said the Travelstar 25GS is the world's highest-capacity notebook hard drive and, with an rpm measurement of 5,400, the fastest as well.

IBM also announced a 12G-byte drive for ultraportable computers and an 18G-byte drive for mainstream portables. Both models spin at 4,200 rpm.

The Travelstar drives are already being shipped to PC manufacturers including Compaq Computer Corp., Dell Computer Corp., Hewlett-Packard Co. and IBM's own Personal Systems Group, according to IBM. ▸

Partyka writes for the IDG News Service in Boston.

BRIEFS

Toshiba to Offer Rewritable CD

Toshiba Corp. has announced it will ship a combination writable/rewritable optical drive and digital video disc (DVD) drive in September. The drive can reach a sustained data-transfer rate of 600K byte/sec. when writing, 5,408K byte/sec. when reading DVD-ROMs and 3,600K byte/sec. when reading CD-ROMs, according to Toshiba.

The SD-R1002 drive will cost about $520.

www.toshiba.com

EBiz Unveils Linux Net Appliance

EBiz Enterprises Inc. has introduced PIA, a Linux-based personal Internet appliance.

The system comes equipped with a 2.1G-byte hard drive, 32M bytes of RAM, an Advanced Micro Devices Inc. processor, a video card, speakers, a keyboard and a mouse, according to the Scottsdale, Ariz.-based company.

The system costs $199.

www.ebizmart.com

Quantum Adds Storage Drive

Quantum Corp. is shipping the DLT 8000, its latest digital linear tape storage drive. Used primarily for system backup and data recovery, the drive offers a native capacity of 40G bytes (up to 80G bytes compressed). The data transfer rate is 6M byte/sec., a 20% gain, according to the Milpitas, Calif.-based company.

The storage drive's pricing starts at $6,000.

www.quantum.com

Getting Smarter

Worldwide shipment projections for smart phones

1999	1.3M
2003	12.9M

SOURCE INTERNATIONAL DATA CORP FRAMINGHAM MASS

Load-Balancing Switches Streamline Web Traffic

Fitness Web site uses ArrowPoint tool to speed access and avoid overload

BY SAMI LAIS

A SMARTER load-balancing switch from ArrowPoint Communications Inc. in Westford, Mass., can go out and learn where content is stored on your system, anticipate and provide for hot content, and get your Web site visitors more quickly to the precise address they seek.

For Thrive Online, a health and fitness Web site that was about to be swamped by its own popularity, the switch was a fast fix, said Steve Wolf, director of Internet applications and technology at the Online Operations division of Thrive Online's parent company, Oxygen Media Inc. in New York.

When Thrive launched the site in 1996, it drew 200,000 viewers each month, each one eager to download recipes and keep up-to-date on health and fitness news. Last year, "we hit the limits of the server," Wolf said. The site's access speed and performance suffered, he said. Even downloading a simple recipe could take up to 20 seconds. For a similar transaction, most business sites average between seven and eight seconds, experts said.

Thrive Online's Web site host, UUnet Technologies Inc. in Fairfax, Va., suggested adding a server and ArrowPoint's CS-100 Content Smart Web switch, Wolf said.

"They wanted to separate the CGI [Common Gateway Interface] content onto another server," said Mitch Ferro, UUnet's director of product management for Internet hosting. But Thrive also wanted to keep the site "completely transparent to the end user and to Thrive's developers," he said.

For Thrive, it has meant that processing-intensive CGI requests go directly to the server dedicated to handling its message board. A second server handles more static transactions, such as downloading recipes.

Recipes in Five Seconds

It has also meant that users get that lemon chicken recipe in five seconds.

Web address-specific switching capability isn't unique to ArrowPoint, said David Callisch, director of market communications at switch maker Alteon Web Systems Inc. in San Jose. Alteon has beta code, free to its customers, that handles the task and will be bundled in its $10,995, eight-port ACEdirector switches by year's end. Alteon uses two RISC processors per port instead of one centralized processor, as Arrow Point does.

Arrow Point's more compelling features are its abilities "to go learn which servers have which content and automatically configure" in order to route traffic to that server, and to react to hot content, said Mark Hoover, president of Acuitive Inc., a consultancy in Wilmington, Del.

The switch responds to increased requests for particular content by initiating the content's replication to cache or an overflow server, said Brian Walck, ArrowPoint's vice president for product management and business development.

The CS100 supports up to 5G bit/sec. throughput and has 16 10/100M bit/sec. Ethernet ports. Its pricing starts at $17,995. The CS800 supports up to 16 full duplex 100BASE-TX ports, and its pricing starts at $35,000. ◗

A Traffic Cop for Your Web Site

Imagine a four-lane highway ending at your front door. Traffic would be madness. You would need a traffic cop.

And you need a switch directing traffic to your Web site.

Of course, you have more than one parking area. A smart traffic cop would direct some cars to lot A, others to lot B.

A client- or TCP-based load-balancing switch directs user requests based on content type requested. It checks the destination IP address or a combination of the destination IP address, protocol and transport port number.

Traffic through, say, port 80, which includes TCP and HTTP, looks the same to the switch. So a Web-enabled SAP AG R/3 transaction looks just like a streaming audio request.

Once at the parking lots, drivers must navigate to the right building. Suppose the traffic cop could glance at the car, know that the driver wanted building A and so then direct the car to lot A instead of lot C.

URL-specific load balancing directs user requests based on the URL requested. It checks the HTTP payload to route incoming TCP flows according to user-defined policies. – *Sami Lais*

JAMES CONNOLLY

Broadband beckons

SAY IT IN YOUR BEST RADIO VOICE: "broadband." Nope. Try again, and do it the way James Earl Jones would when identifying CNN: "BROADBAND." The difference isn't just in tone and resonance. The small-b version is what a handful of your power users and telecommuters have been playing with. Maybe they live in one of the few towns with Digital Subscriber Line (DSL) access. Maybe they're the co-workers who tell you their cable modem is just wonderful — but whisper it, hoping nobody in their neighborhood will hear and take their own share of the bandwidth.

BROADBAND is a distant elephant stampede that corporate Web site managers had better start preparing for. And don't think it's just about transmission speed.

If you're running a site today, you should know that the persistent connections that come with broadband will be at least as important as raw throughput. Both DSL and the competing cable modem technologies allow full-time, dedicated connections to the Web. And, boy, will consumers like that once they get a taste of it.

Corporate Web managers need look no further than their own offices to imagine how a jump in residential broadband use will raise the bar for them in terms of performance, security, site design and content freshness. Managers already can see employees on the phone, hearing about a Web site (perhaps a potential business partner) and, midcall, hitting that site courtesy of a T1 data line. Response has to be quick and clean.

JAMES CONNOLLY is *Computerworld's* technology evaluations editor. Contact him at *james_connolly@computerworld.com.*

Now picture your consumer at home, watching TV and yacking on the phone with Uncle Charlie when he gets the inspiration to check out your latest widget — and the one offered by your competitor.

Again, no need to break the conversation; the broadband connection is always there.

You're right, DSL and cable modems haven't had a huge impact on either the consumer or business sectors, and the phone and cable companies are probably being overly optimistic if they say tens of millions of consumers will move to broadband by year's end. Service providers expect to greatly widen DSL and cable modem access in the coming months, but a recent report by research group Infobeads in La Jolla, Calif., shows that more than 60% of Web users don't plan to move to broadband in the next year.

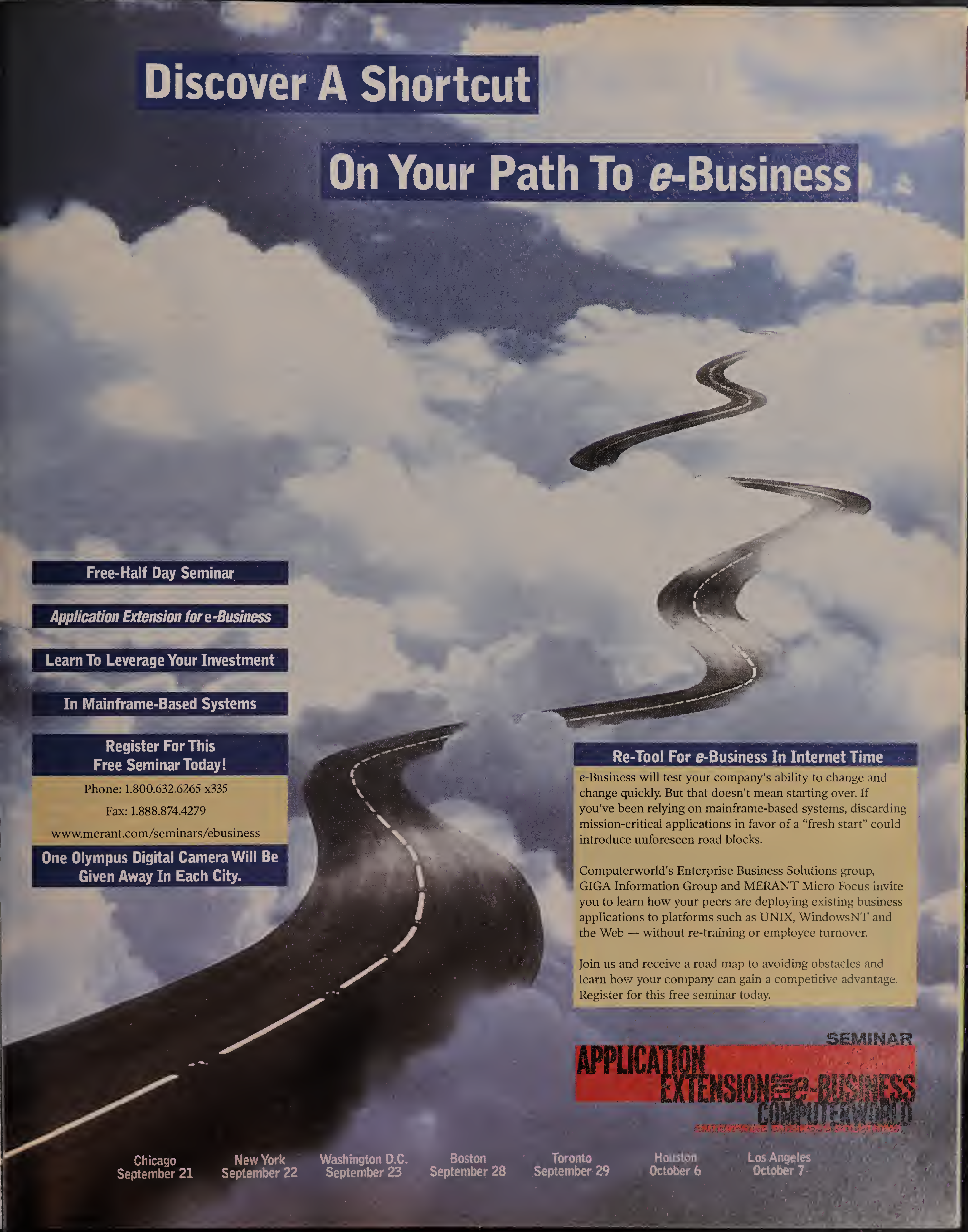
However, even if it takes a little longer and slightly fewer than expected consumers upgrade, broadband is coming.

And the consumer-to-business relationship will never be the same because of it.

Now you have to ask yourself if your site is ready for this demanding, easily spoiled, easily turned-off consumer.

Do you need to be ready by the end of this year? Probably not.

By the end of next year? Well, there's a darn good chance. ◗



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Yet Another Search Service?

Searchbutton.com offers free site indexing and search monitoring

BY CYNTHIA MORGAN

THE BEST computer tools usually get their start as part of somebody's personal bag of tricks, and the offerings from Searchbutton.com are no exception. Searchbutton's site-specific search engine, which tracks corporate Web site pages, provides detailed search capabilities to visitors and reports back on the queries it receives, began as a way to ease the strain of a series of consulting projects.

CEO Miles Kehoe floated Searchbutton.com from his Silicon Valley consulting business, New Idea Engineering Inc. He and Chief Technology Officer Mark Bennett are former employees of Verity Inc., a good training ground indeed when Web site indexing and searching is your primary goal.

Outsourcing Web site searches isn't a new idea; the first corporate sites often borrowed search capabilities from major search engines such as Yahoo Inc., Lycos Inc. and AltaVista Co.. What is new, however, is that humans are on the other end of this search, reporting problems, providing work-arounds for special situations and reporting on the results. In addition, Searchbutton.com's service is likely to be far less costly and labor-intensive than do-it-yourself searching with commercial search engine kits.

Searchbutton.com uses an age-old (well, age-old for the Web, anyway) technique known as spidering. To use the service, you simply subscribe by going to the Searchbutton.com site and apply with some basic site information. The company sends a small application, known as an agent, or spider, to "crawl" the pages of your site and return information on the content it finds.

Searchbutton.com uses the information to build an index of the data contained on your site.

The company supplies a small applet that includes the basic and advanced search forms and a Searchbutton.com banner ad. When a visitor activates the search form, his query is transparently redirected to Searchbutton.com servers that return an answer gathered from your site's index information. Spiders check for site updates regularly. Kehoe says they will check "frequently," and you can request an update and re-index pages that have changed.

Monthly Report

The company will report monthly on the search query results it has received for your site. The report includes information on who's doing the searching, what they're looking for and what they're not finding. Fine-tuned site analysis tools can grab Searchbutton.com results and use the information to figure out which site visitors can't find.

The service is free for sites with up to 2,500 pages, if you don't mind putting the ad banner on your site. Pricing for the company's pay services begins at $300 per year for small sites and include indexing of up to 5,000 pages.

The spiders work with most Web servers and well-behaved Web pages. They support the fancier grades of webbery such as XML and Dynamic HTML and the peculiarities of Allaire Corp.'s ColdFusion and Microsoft Corp.'s Active Server.

The tools that Searchbutton.com supplies do have some limitations, however. The free service, for example, may have trouble indexing all pages on sites with multiple servers or understanding server-side image maps, which are large graphics that may contain multiple links or activate several tasks. And the service presently isn't compatible with IBM's Lotus Domino, which keeps it out of contention in many Lotus Notes shops.

There are less severe problems with some Web components such as JavaScript events and frames that Searchbutton.com engineers say they have work-arounds for.

Look elsewhere if your site is a complex conglomeration of multimedia files, odd application types and convoluted frame sets. Ditto for sites with a massive number of pages backed up by huge databases. Webmasters at those sites should consider professional search engines from the likes of AltaVista, Verity and Fulcrum, if they haven't already.

But for garden-variety, corporate Web sites, Searchbutton.com and its competitors may help you gain advanced search capabilities for your site inexpensively. ◗

Searchbutton.com

Location: 480 San Antonio Road
Suite 235
Mountain View, Calif. 94040

SEARCHBUTTON.COM'S Mark Bennett, from left, Nick Halsey and Miles Kehoe built the start-up from a Web consulting service

Telephone: (650) 947-8310

Web: *www.searchbutton.com*

Niche: Web site search engine service

Why it's worth watching:
Searchbutton.com lets you outsource Web site indexing and search chores. It adds free or relatively low-cost search tools to your Web site and provides reports on visitor queries.

Company officers:
- Miles Kehoe, president and founder
- Nick Halsey, CEO
- Mark Bennett, chief technology officer

Milestones:
- January 1999: Company founded
- August 1999: Searchbutton.com service launched

Pricing:
- Free service requires placement of a Searchbutton.com banner ad on the site.
- Searchbutton Plus pricing starts at $300 per year for 1,000 to 5,000 Web pages and 30,000 search queries per month.
- Searchbutton.com custom pricing depends on requirements.

Red flags for IT:
- Searchbutton.com overlaps so many Internet tool categories that it'll be a tough sell.
- Supports only HTML and text documents right now, although the company says it will soon add other formats.
- The service doesn't work with IBM's Lotus Domino, a server popular in many corporate sectors, and a few other important Web components.

COMPUTERWORLD emerging companies

[the buzz]
STATE OF THE MARKET

Bandwagon Effect

The question isn't who competes with Searchbutton.com, it's who doesn't compete. This company's search engine and reporting service overlaps with some important – and hotly contested – Internet tool categories, such as site monitoring and analysis applications and Web personalization systems.

The Portals

Search engine portals, such as AltaVista, Lycos, InfoSeek and HotBot, offer a free search applet, usually linked to their portal service, that administrators can add to a site for free. Those indexers aren't always complete, may not dig down to every page in a deep site or may rely on external indexing agents you can't control. But they're not a bad choice for small sites or subsites. AltaVista's free tool, for example, will index up to 3,000 Web pages or PC files.

Commercial Side

AltaVista also sells its search engine technology to organizations with massive amounts of information, such as Amazon.com and the FBI. Here, it competes with the likes of Verity, Fulcrum and others. The ultimate luxury in do-it-yourself site indexing, these tools require proper tuning and a trained technician or three to handle the data warehousefuls of information they're capable of indexing.

Search Engine Services

Searchbutton.com also has competitors in its own niche, such as WhatUSeek (*www.whatuseek.com*), MyComputer.com Inc.'s SiteMiner (*www.siteminer.com*), Avivo Corp.'s Atomz (*www.atomz.com*) and FreeFind (*www.freefind.com*).

SiteMiner, for example, also reports back on the searches made at your site. Its sister service, SuperStats, is already one of the largest Web site monitoring services on the Internet. MyComputer, a 1997 start-up that depends on banner ad revenue, also offers WatchDog, an around-the-clock service that notifies you if your Web site goes down and links checking services.

Similarly, Avivo's Atomz service has been well received by Web developers. Formed by three ex-Macromedia Inc. employees, this start-up limits its free search tools to sites with fewer than 500 pages and 5,000 searches per month, while Searchbutton.com supports up to 30,000 searches per month.

E-Business Services *BRIEF*

Application Hosting: Ready for Prime Time?

Clarent taps Corio for PeopleSoft applications

Dave Blumhorst is Director, Information Technologies at Clarent, a Redwood City, CA based manufacturer of Voice Over IP gateways that allow users to route voice telephone traffic over high-speed data lines. We interviewed Dave about his decision to outsource a large PeopleSoft application and the benefits of that decision. Dave described this application hosting project at the SMARTsourcing Conference and Expo in San Francisco.

CW: Please describe your current outsourcing project.

BLUMHORST: We're outsourcing PeopleSoft through Corio, which is an application service provider. We were looking for a financial package, and we wanted to get off our old system, which was a kluge of various packages. Most companies our size typically migrate from a system like ours to a mid-tier financials package. These packages work well, but they are not as process-oriented as the major ERP packages, and if you are planning to become a really big company, they have less value because they tend not to scale effectively. Typically, users go from a small system to a mid-tier system, and a few years later, if they're lucky and they grow well, they go to a large system, such as those from PeopleSoft, SAP and Baan.

CW: What decision-making process led to this outsourcing project?

BLUMHORST: If we implemented a mid-tier package now, and then in three or four years needed to graduate to a large package, the conversion process would be immense. This is usually the case when you have grown to be a bigger company. On top of that, it can cost millions of dollars. You've already got a lot of data in your mid-tier system, and you've got a lot of ingrained processes that your people are used to that have to be changed out. You have to change the workflows in finance and order administration. It can take up to a year, and sometimes more.

CW: Once you made the decision to outsource, what are your responsibilities?

BLUMHORST: We have only a few responsibilities. My IT department will add user names and will install the client on the desktop. That's about it. If there are problems with anything else in the installation, or in the running of PeopleSoft, we will first go to our key internal users. They are akin to super users, people who really know the system well. They will then escalate the situation to Corio, who is providing 24 x 7 tech support to us.

CW: What made Clarent choose Corio?

BLUMHORST: We received a reference from another company that recommended outsourcing because you don't have to pay for the whole implementation, and even though you are a mid-sized company, you gain the advantages of a big package.

CW: Once you had all the facts, was outsourcing a no-brainer?

BLUMHORST: No. As the IT director, I went through some angst over having such a critical application sitting in someone else's shop where I didn't control it.

CW: What were the pros and cons you considered?

BLUMHORST: One pro was being able to get into a bigger system much sooner and avoiding that massive conversion process later. By sooner, I mean three or four years. We just went live this week [the first week in August] and it took us four months to reach this point. If we had done it on our own a few years from now, I would say it would have taken at least 12 months. Going to a high-end package also gave us a competitive edge. We have all the processes of a big company in a smaller company of about 200 employees.

CW: How about some cons?

BLUMHORST: Actually, one of the cons turned out to be a pro. As I said, the biggest con in my mind was having someone else tending to this critical application. I was afraid we might end up with an application that wasn't serviced right, wasn't performing right, and wasn't in our control. I went over to Corio and visited their headquarters, saw their operations and realized that my concern wasn't well-founded. They have top-notch talent and a superior, outsourced data center.

CW: At this point, is it too early to tell how the application is working?

BLUMHORST: Things are going surprisingly smoothly. I expected to have issues during the first few days with such a major implementation. You can do all the testing you want before going live, but when you put the system with real users, serious things usually come up. We seem to have avoided them. We had minor glitches instead of major ones.

CW: Is this initial success attributable to you and Corio working closely together?

BLUMHORST: Yes, we worked very closely together. Corio brought in a team of seven or eight consultants that had good experience in their respective fields. They also brought in a really good project manager. I think the way they managed the project and their experience made for a smooth and rapid implementation.

CW: How will your future relationship with Corio work?

BLUMHORST: It will be an ongoing relationship. We should be in touch with each other quite a bit because as we start using the PeopleSoft product more and understand what it can do, we will want to expand its usage. We'll need to talk to Corio about how to do that. We'll also be in touch with Corio with any operational questions that we have.

CW: What is the bottom line for this project?

BLUMHORST: The bottom line is that outsourcing turned out to be an excellent option for us. ■

Optimum Mix of Services Key to Future Success

Successful organizations will increasingly rely on external IT service providers in order to implement "best of breed" solutions, reduce implementation time and improve business processes. However, choosing the right strategic partner becomes increasingly difficult given the myriad of available service options.

The **SMARTsourcing** Conference and Expo Series' goal is to provide business and IT professionals with a clear analysis of the latest sourcing models and expert insight into successful relationship management practices. The **SMARTsourcing Conference Series** is the only forum providing IT decision-makers with comprehensive coverage of the entire services landscape from traditional IT outsourcing services to the emerging E-Business service offerings.

Sessions will provide in-depth coverage of issues to be considered when entering outsourcing agreements, tips on getting the most value out of existing outsourcing relationships and partners, as well as the latest trends and available services including: CRM, ERP, Application Hosting, BPO, Application Development Outsourcing, Maintenance Outsourcing, Legacy Transformation, E-Strategy, and more.

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Editorial by: COMPUTERWORLD
ENTERPRISE BUSINESS SOLUTIONS

Network Appliances

BY KIM FULCHER LINKINS

OK, SO YOU'RE tired of losing your Internet connection every time an application on the server crashes. You'd like a server that handles just e-mail, so that you plug in and it goes, and you don't want it to bust your budget.

Enter the network appliance.

These devices are self-contained, self-maintained computer peripherals that can keep your users connected to the Internet and intranet with little or no information technology intervention.

"When you talk about a [network] appliance, basically, it's just like any other appliance like a refrigerator or microwave," says Pu Xaing, an analyst at Gartner Group Inc. in Santa Clara, Calif. "It does one function but does it extremely well."

That single function enables the appliances to be very robust with little configuration. Experts say you just plug them in to a wall and they're ready to use.

"The main thing to think about is not that they're a new class of appliances, but really, you can think of the existing world of appliances and you're adding network capability to them in interesting ways," says Sandeep Singhal, senior architect at IBM's Pervasive Computing Division.

A household appliance is typically in a closed box that's easy to install and requires low maintenance. "It's the same with [network] appliances," Xaing says. They require minimum systems maintenance because the appliance is closed. It does the function it's specialized in, Xaing says.

Brad Romney, business unit manager for small business networking operations at Intel Corp.'s Network Systems Division, says network devices can offer a variety of services to a group of individuals who are networked together with PCs. "For example, you might share printers, you might share files on a storage device, you might share Internet access, you might share e-mail," he says.

Network devices can include network-attached disks, cameras and displays; set-top boxes and Web browsers; handheld and portable devices; application gateways; and special-purpose servers, such as Web and file servers.

Users can't modify, customize or personalize network appliances, but users can get access to network information, according to Greg Blatnik, vice president at Zona Research Inc. in Redwood City, Calif.

"Network devices can be used to replace one function or one subset of functions of a traditional general-purpose server," Xaing says. "But the difference is these appliances come with the hardware and the software together instead of the general-purpose servers in the past. They have been used mainly when the IT department buys one server and then you have to completely load the software or applications on it and then tweak it."

As for maintenance, "the management can easily be done through a Web browser remotely," Xaing says.

General-purpose servers tend to get burdened by trying to run too many applications at the same time, Xaing says. "Because of that, if one part fails, the whole server has to be shut down to be serviced," she says.

With a network appliance, you can take those parts of the applications off the general-purpose server. That gives more space for the server to do its core applications like computing or other, more complicated functions that require more memory and space, Xaing says.

The chances of network appliances failing are few, and if they do, only one application is affected instead of the whole system being shut down.

Network appliances do provide users with a certain level of reliability, experts say. "It has appliance-grade reliability," Singhal says. "In other words, it crashes as often as a washer or dryer malfunctions."

Xaing says the benefits of using network appliances include ease of installation, very low maintenance and very low total cost in terms of both initial purchase and overall cost of ownership.

"These products are typically installed, managed, changed and maintained over time through a simple Web interface," Romney says.

Network appliances generally sell for $500 to $1,000.

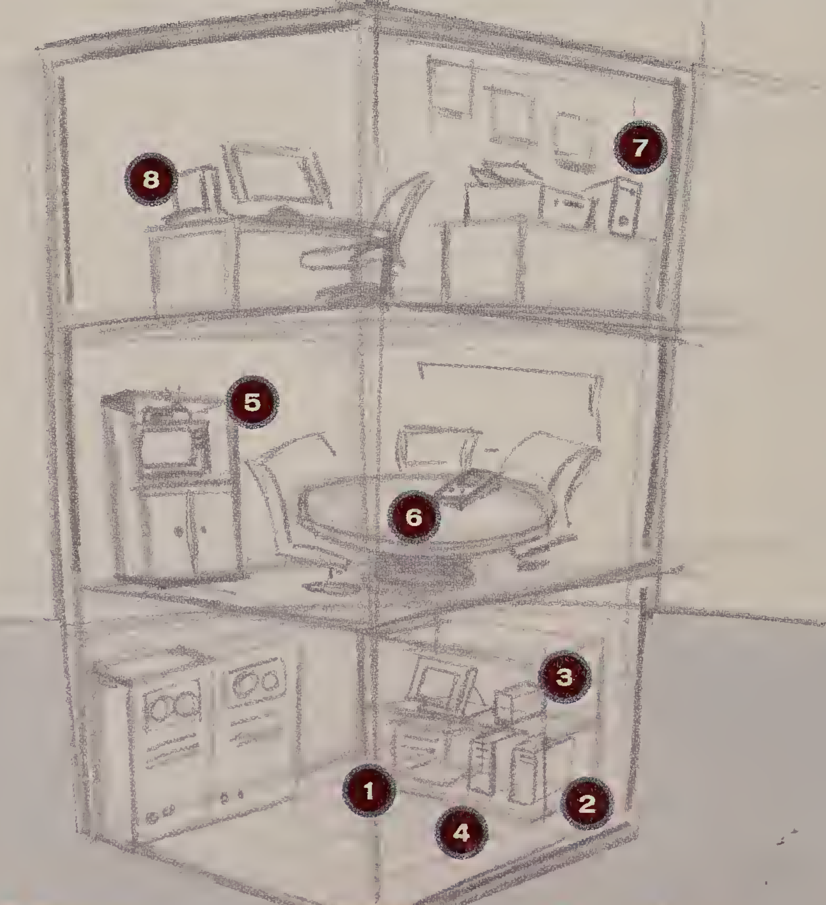
Though still in the beginning stages of market acceptance, network appliance product lines are being developed by companies such as Oracle Corp., IBM and Intel, which are looking to capitalize on their potential. ◗

DEFINITION

[A network appliance is a computer peripheral that enables Internet access and specialized business use. It generally has one function and does it very well. Network appliances comprise hardware and software in one package, so they are easy to install — just plug the appliance in to a wall. And they require very little maintenance.]

Office Appliances

Here are some examples of network appliances and how they might fit into your office:



❶ Web server
Serves up Web pages – many companies use Web servers solely for that reason. When a request is made by a user's computer for a specific Web page, the server fetches that page by name and sends it to the user's browser.

❷ Application gateway
Applies security mechanisms to specific applications, such as file transfer protocol and Telnet servers. Companies with very specific security needs may find this appliance useful but slow.

❸ E-mail server or e-mail station
Manages the messages that are sent back and forth between users on a LAN. It also manages the messages between users on a LAN and outside users.

❹ Firewall
Prevents unauthorized access to or from a private network. Firewalls can be implemented in hardware and software or a combination of both. The firewall is the security guard of the network and has one job – to look over every piece of information that flows in or out of the network.

❺ Handheld computer or palmtop
Maintains schedules, keeps names and phone numbers, does simple calculations, takes notes and, with a modem, exchanges e-mail and gets information from the Web.

❻ Set-top box
Talks to the Internet. It contains a Web browser and the Internet's main protocol, TCP/IP. It connects through a phone line or cable TV.

❼ Print server or print station
Hooks to a printer and allows users on the network to access that printer.

Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to QuickStudy editor Stefanie McCann at stefanie_mccann@computerworld.com.

Linkins is a freelance writer in Austin, Texas. She can be contacted at kplinkins@aol.com.

MOREONLINE

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A Bigger, Better Picture

BY RUSSELL KAY

HOT NEWS! Based on comparison tests I conducted for *Computerworld*, you can now buy an under-$1,000 digital camera that takes pictures as good as those from a $10 disposable film camera. Now that's progress, but the fact is, it wasn't true just a year or two ago. With the latest crop of 2-megapixel cameras introduced this spring, digital photo quality is finally beginning to approach that of film. So if you've thought about getting an expensive digital camera for personal or business use but held off because you didn't want to sacrifice picture quality, you've now got some interesting choices.

Like most other computer-related hardware, prices for digital cameras have been falling. Each year the major players in the digital camera market (which include Epson America Inc., Eastman Kodak Co., Nikon Inc., Minolta Corp., Canon USA Inc. and Olympus Image Systems Inc.) introduce new cameras priced at $800 to $1,000, with 30% to 50% better resolution than their previous models. At the same time, they cut the prices on the previous year's top-line models, for extremely good deals.

Newer Are Better

But the new models are clearly the best yet. According to analyst Kevin Kane at International Data Corp. in Framingham, Mass., the new photo-quality, point-and-shoot digital cameras are generating considerable interest.

"[Businesspeople] often purchase these cameras for work but make use of them at home, too," Kane says. "As a result," more high-quality digital cameras are entering standard distribution channels than ever before.

Picking the right camera needn't be a tough choice. Quality, for the most part, can be described with a single specification and resolution, and you want a camera that offers 2-megapixel capability. Once you reach that level, the difference between 2.1 and 2.3 megapixels isn't significant.

Ease of use should be an important part of your decision. All three cameras I tested let you know what they're doing and how they're set up by means of both an LCD panel on the top and a built-in, color LCD viewscreen on the back. These displays rely heavily on icons, and you change settings with a variety of buttons. There's no standardization among makes for the number, labeling, placement or use of the buttons or icons, and some cameras are much easier to use than others.

However, none was as simple as a standard, autofocus, film camera, and some were confusingly complex. For any digital camera, I suggest you keep the owner's manual close at hand. In this group, I found the Olympus the easiest to use by a small margin.

Cast of Characters

For this review, I looked at two 2-megapixel cameras, the $999 Nikon CoolPix 950 and Olympus C2000Z plus the $1,199 Canon PowerShot Pro70, a very different camera with somewhat lower resolution but a unique personality.

All feature zoom lenses, LCD viewscreens plus eye-level viewers, close-up modes, automatic focusing, removable memory and many special features.

Any of these cameras would be a good choice for high-quality digital images. Prints from a quality color inkjet printer on photo paper are sharp and good.

However, if I were buying one of these cameras, my first choice for general personal use would be the Olympus for its combination of all-around versatility, outstanding quality and compact size. For close-up photography, however, I'd pick the Nikon. But none is a loser; they all take good pictures, and each has its special advantages. ◗

MOREONLINE

For more information on flash memory – the digital equivalent of film, visit our Web site.
www.computerworld.com/more

Nikon CoolPix 950

(www.nikonusa.com)
$999

Of the three cameras tested, this latest top-of-the-line consumer unit from Nikon is clearly the most versatile and suited to the widest variety of photographic tasks. It's outstanding for close-up photography, focusing down to just eight-tenths of an inch in front of the lens. It also offers the greatest number of shooting modes, options and resolutions, but that power comes at the price of operational complexity, which makes it the hardest to learn how to use.

The Nikon has a swiveling LCD screen that lets you use the camera from various positions. You can even swivel the screen to face forward, where it flips the image so your subjects can see how they'll look. This might be especially handy when using the self-timer.

Olympus C2000Z

(www.olympus.com)
$999

As the newest model in this group, the Olympus has a lot going for it. Although it's the smallest, it can do almost everything the others can, and it's relatively simple and pleasant to use. Unlike the Nikon and Canon, it uses SmartMedia memory cards.

The LCD viewfinder is fixed on the back of the camera, which makes it less useful than the movable screens of the Nikon and Canon cameras, particularly if you use the camera at waist level or at arm's length. But except for extreme close-ups, the Olympus is a fine performer. It's quick to get ready for the next shot, with a shorter processing delay than the other two cameras. Of the three, I believe a novice would become familiar with the Olympus in the shortest time.

Canon PowerShot Pro

(www.usa.canon.com)
$1,199

This Canon is quite different from the other two cameras. It's much bigger and bulkier, with a large housing surrounding its nonretractable zoom lens. Although it feels and handles a lot like a 35mm single-lens reflex camera, it still uses a separate viewfinder. As a former photojournalist, I like the way the Canon handles, but I expect most people will find it too bulky and clumsy.

On the plus side, the Canon has slots for two compact flash cards, thus increasing the number of pictures it can take before reloading. I also liked the fact that the LCD viewscreen folds neatly into the camera back when not in use, protecting the screen from scratches and fingerprints.

The Pro70 doesn't quite match the resolution of the Olympus and Nikon cameras, but its photos look nearly as good when viewed side by side on-screen or when printed.

Too Much TOO FAST

PC vendors are fast-tracking several blue-sky, never-mind-backward compatibility changes. Elements as basic as the floppy drive may be ditched, creating support and compatibility nightmares for you. An exclusive *Computerworld* survey shows IT shops like the ideas – but want to take it slow By Frank Hayes

NOT SO FAST. That's the message corporate information technology shops have for vendors that want to radically redesign the venerable desktop PC.

Intel Corp. and Microsoft Corp. are spearheading those plans through initiatives with names like PC 99, Easy PC and Legacy-Free PC. They would wipe out some elements of the desktop computer that have been standard since the IBM Personal Computer was introduced in 1981. And the first PC designs based on the new specifications, from Intel, IBM, Gateway and Hewlett-Packard Co., will be previewed at Intel's Developer's Forum later this month in Palm Springs, Calif.

But the changes — which include elimination of serial and printer ports, traditional Industry Standard Architecture (ISA) add-in card slots and even floppy-disk drives — could wreak havoc on corporate IT departments and their users, who are already struggling to cope with year 2000 fixes and enterprise software deployments.

"Over the next five years, none of these proposals would be a problem," says Howard Launstein, corporate controller at Oil Gear Co. in Milwaukee. But right now?

According to an exclusive *Computerworld* survey of more than 100 IT shops, most of the proposed changes would make corporate IT professionals less likely to buy those new PCs today.

The survey, conducted last month among IT managers and executives at organizations with 500 or more employees, checked out their willingness to purchase PCs with each of the 11 changes proposed by Intel and Microsoft in their PC 99 specification (see survey results box, next page).

The PC 99 changes would rid the desktop PC of many of its most resource-hungry elements — the ones that gobble up interrupt request lines and direct-memory access channels, making life miserable for IT support teams that must reconfigure users' PCs. And dumping some legacy features would also cut the cost of PCs.

But Intel and Microsoft would prefer to make all those changes at once — an idea corporate IT shops aren't buying.

What are the changes, and how will they fare with corporate IT? Here's a scorecard for what to *really* expect in the next generation of PCs:

ISA Elimination

Intel's goal: Eliminate traditional ISA slots for add-in cards
IT response: Very favorable now
Outlook: Inevitable

PC vendors say they believe most ISA slots already sit empty. Vendors have been floating the idea of ISA elimination for two or three years, and the replacement, Peripheral Component Interconnect (PCI), is already a standard. Corporate IT shops don't disagree. "PCI is faster, better and smaller," says Todd Richter, a PC specialist at Baystate Health System in Springfield, Mass. "It's time to move on."

Intel plans to stop supporting ISA slots with its own chip sets next year. Though users like the idea, there's some concern about the cost and possibility of replacing specialized ISA cards with PCI equivalents.

Form Factor: The Final Frontier

Why radically rework the PC? One major goal is to give vendors much more flexibility in the size and shape of PCs. "If you get rid of the slots and connectors, the box gets smaller," says **Pat Gelsinger,** who manages Intel's desktop products group. "Then you can velcro a PC under a travel agent's desk or stick it to the side of a cart at Oil Can Henry's."

That goal rings true with corporate information technology executives. "Give me my desktop back!" says **David Lewis,** acting CIO for the state of Massachusetts in Boston. "With 17- and 19-in. monitors, PCs take up more of the desktop than ever," agrees **Howard Launstein,** corporate controller at Oil Gear Co. in Milwaukee. "We've all bought all this furniture" to accommodate large current PCs, Lewis says. "Reduce [the PC] down to a flat panel with a keyboard attached, and it would really make a difference." Lewis contends that if such a setup cost only "$100 more than a CRT, you'd never see another PC sold that's a box with a CRT. The ergonomic issues are so overpowering."

– Frank Hayes

Quick Power-Up

Intel's goal: Enable PCs to boot up very quickly
IT response: Very favorable now
Outlook: Likely to be implemented, not likely to work

IT shops don't believe in Santa Claus, easy Y2K fixes or fast boot-ups. They say they think current power-up delays are largely due to network log-ons and operating system loading time, not PC hardware-related delays. They'll believe it when they see it, Launstein says. But if vendors can make it happen, they won't complain.

Remove Parallel Printer Port

Intel's goal: Replace parallel printer port with Universal Serial Bus (USB)
IT response: Neutral now, favorable next year
Outlook: Will happen fairly quickly
Fallback: PCI add-in card, USB-to-parallel-printer interface

Not likely to be a major issue. "I love USB. It just works," says Kalman Shor, director of information systems at Michael Anthony Jewelers Inc. in Mount Vernon, N.Y. New corporate PCs have USB for the few cases in which a local printer is required; most users use networked printers. A USB interface for a parallel printer will likely become an added-cost item.

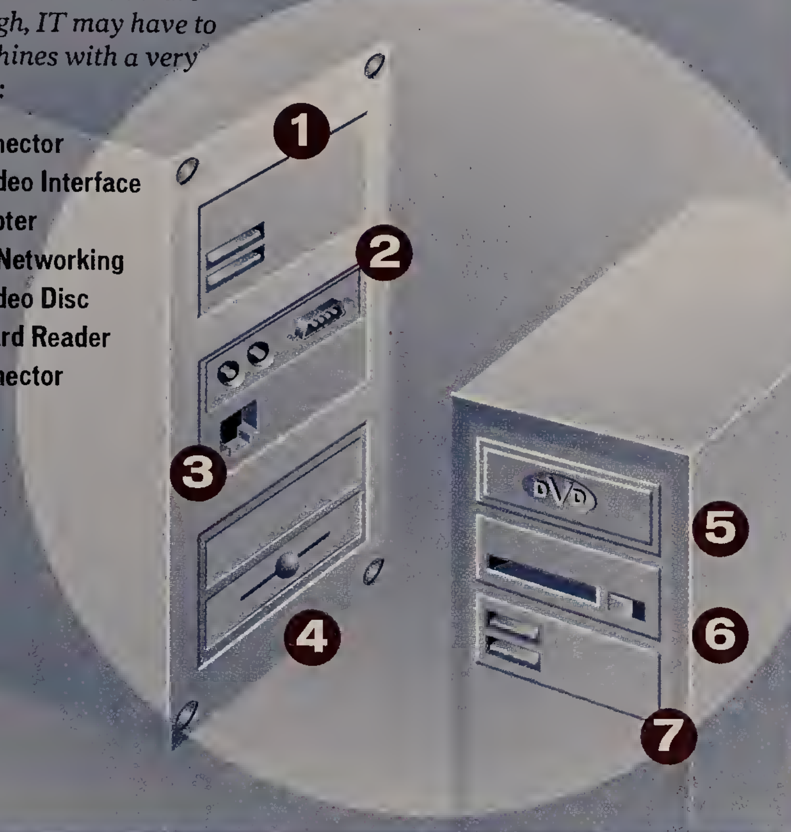
Remove Serial Ports

Intel's goal: Replace serial ports with USB
IT response: Neutral now, favorable next year
Outlook: Will happen fairly quickly
Fallback: PCI add-in card; USB-to-serial interface

IT shops have a few more concerns about eliminating serial ports rather than printer ports but will accept the change a year from now. New PCs have USB, and serial ports can be added via USB

What Tomorrow's PC May Look Like

If initiatives such as PC 99 are pushed through, IT may have to phase in machines with a very different look:



1. USB Connector
2. Digital Video Interface
3. ATM Adapter
4. Wireless Networking
5. Digital Video Disc
6. Smart-Card Reader
7. USB Connector

Corporate IT shops like some of the ideas . . .

Quick power-up:	5.2
Replace today's expansion slots with PCI:	5.5
Replace parallel printer port with USB:	4.1
Replace serial port with USB or FireWire:	3.9
Replace VGA with digital interface:	3.7
Eliminate floppy disk:	2.8
Replace IDE hard disk interface with SCSI, USB or FireWire:	4.1
Replace current fans with low-power, muffled fan systems:	4.0
Add smart-card reader:	3.3
Replace Ethernet networking adapter with ATM adapter:	2.5
Add wireless networking capability:	3.2

. . . but will like them better a year from now

Quick power-up:	5.3
Replace today's expansion slots with PCI:	5.6
Replace parallel printer port with USB:	4.8
Replace serial port with USB or FireWire:	4.8
Replace VGA with digital interface:	4.6
Eliminate floppy disk:	2.9
Replace IDE hard disk interface with SCSI, USB or FireWire:	4.6
Replace current fans with low-power, muffled fan systems:	4.3
Add smart-card reader:	4.0
Replace Ethernet networking adapter with ATM adapter:	3.0
Add wireless networking capability:	3.2

Note: Ratings are on a 1-7 scale, with 1 meaning "not at all likely" to buy a PC with this feature and 7 meaning "very likely."

SOURCE: COMPUTERWORLD MARKETVIEW SURVEY OF 100 IT PROFESSIONALS AT ORGANIZATIONS WITH 500 OR MORE EMPLOYEES

or a PCI add-on card in cases where a special or legacy device requires it.

Remove IDE

Intel's goal: Replace integrated drive electronics (IDE) hard disk interface with SCSI, USB or IEEE 1394, known as FireWire
IT response: Neutral now, favorable next year
Outlook: May face opposition that will slow adoption

Our survey shows users would react favorably to replacing IDE, but interviews suggest there's resistance. USB and FireWire aren't viewed as appropriate for internal connections to anything, and while SCSI is fast and reliable, SCSI hard drives are currently substantially more expensive than IDE.

But if SCSI drive prices fall and the change is invisible to customers, it may prove acceptable.

Replace VGA

Intel's goal: Replace VGA with a new digital interface that supports both CRT monitors and flat-panel screens
IT response: Slightly negative now, favorable next year
Outlook: Will face opposition
Fallback: PCI add-in card

VGA is viewed as only slightly more broken than IDE. In addition, the large existing investment in VGA monitors will discourage migration until those monitors are obsolete — maybe as long as three years. "There will be a lot of cheap VGA monitors out there for a long time," Richter says. The cost of new flat-panel monitors will drive acceptance of the new video interface; if they're cheap and popular, so long, VGA.

STELLA JOHNSON

> "Give me my desktop back!"
> – David Lewis, State of Massachusetts

Quieter Fan

Intel's goal: Replace existing PC fans with low-power, muffled fan systems
IT response: Neutral now, slightly favorable next year
Outlook: Inevitable

A no-brainer — IT shops simply don't care, except for the fact that the combination fan/power supply is the piece of the current PC architecture most likely to fail catastrophically. "If that was the only noise in the office, I'd worry about it," Launstein says.

Smart-Card Reader

Intel's goal: Add a smart-card reader to the standard PC
IT response: Negative now, neutral next year
Outlook: Depends on cost

IT shops don't see a need for smart-card readers. For e-commerce? Not from users' desks. For authentication? Most users don't move from PC to PC, at least not today. Until there are useful back-end applications that make the smart card valuable, they will lag.

No one objects to a reader as long as it doesn't add much to the PC's cost — about $10 would be fine, one user says.

Wireless Networking

Intel's goal: Add wireless networking to the standard PC
IT response: Negative now, neutral next year
Outlook: Unlikely

If you need it, it sounds like a great idea. But most users don't move around that much, and most IT shops don't have much experience with wireless networking. New uses such as PCs velcroed to the bottom of mail carts, will take time to accept. This will remain a niche item.

Replace Ethernet With ATM

Intel's goal: Replace the Ethernet network adapter with an Asynchronous Transfer Mode network adapter
IT response: Very negative now and next year
Outlook: Doomed
Fallback: PCI add-in card

IT shops know Ethernet. They like Ethernet. They haven't run out of Ethernet capacity by a long shot. "We don't use 10% of our [Ethernet] bandwidth on a normal day," Shor says. And until multimedia or some other innovation chews up huge amounts of bandwidth, they see no reason to switch. An additional barrier is that many offices would require cable upgrades.

Eliminate Floppy

Intel's goal: Eliminate the floppy disk drive
IT response: Very negative now and next year
Outlook: Depends on what will replace it
Fallback: Superdisk drives (partial solution)

They used to be indispensable for moving files. Now many documents are too large to fit on a single floppy, and users often simply e-mail the files — even to themselves, to work on at home. But IT shops still assume the floppy will have to be replaced, not simply eliminated. "I look at my desk here; there are floppies scattered all over it," says David Lewis, acting CIO for the state of Massachusetts in Boston. "What else am I going to use?" Alternatives include zip drives, superdisk drives and other low-cost, high-capacity, portable media. ◗

Hayes is Computerworld*'s staff columnist. His Internet address is frank_hayes@computerworld.com.*

CRM RISES TO THE TOP

EVEREN SECURITIES' MICHAEL ROMAN: "We want to take the sales rep out of technology and put them in sales mode"

MARC BERLOW

Sales force automation users discover that customer relationship management is what really matters

By Amy Helen Johnson

IN THE TWO YEARS since Mentor Graphics Corp. installed a sales force automation suite, productivity among the sales staff has increased 25%, says Ken Bado, senior vice president of world trade at the Wilsonville, Ore., company. "The key is, our managers use the tool religiously," he says. Now Bado wants to increase the productivity of his customers — the engineers who use the company's electronic design automation software to build everything from system-on-chip semiconductors to computer motherboards. His strategy is to push sales and marketing information onto the company's Web site, making it an around-the-clock resource for engineers.

Mentor Graphics, which uses Sales Enterprise from San Mateo, Calif.-based Siebel Systems Inc., is part of a growing trend in sales force automation: companies switching from focusing on process automation to improving the customer's experience.

Sales force automation "is a backbone, but it's not an island," says Bob Thompson, president of Front Line Solutions, a Burlingame, Calif.-based consultancy specializing in relationship management issues. Businesses are starting to think about the whole customer life cycle, not just the sales operation, he says.

Interviews with industry analysts and information technology managers show that companies are leveraging their sales force automation systems to develop new sales, marketing and support tools.

Customer Wish Lists

Most sales force automation vendors have adopted the moniker "customer relationship management" (CRM) software to better describe the new purpose of their products. They have been busy this year adding features and capabilities to their software; next year they'll be just as busy, working on wish lists from customers like Martin J. Levins, director of corporate teleservice at labor-management software vendor Kronos Inc. in Waltham, Mass.

Kronos, which uses products from San Jose-based Clarify Inc., bought its first module, Clear Support, about four years ago. Then came Clear Sales, which has been in use for 18 months. Levins says the packages have done a lot to improve the lives of sales and marketing employees at Kronos. Now he wants to reach out to his customers using Clarify products.

What's on his wish list? A customized electronic newsletter based on client data contained in Clarify; instant price quotes from within the system instead of waiting for quotes from a third-party; target marketing through a mail-merge feature added to Clarify; and the ability to synchronize information in Clarify with information from the company's back-office package, so the accounting department knows the customers as well as the salespeople do.

Thompson says Kronos has a good chance of seeing its wishes granted, but it won't be easy. Vendors are improving offerings, but implementing those systems is still a challenge. "[Sales force automation] or CRM has been difficult," Thompson says. "Not everyone's hitting a home run with every project." On the positive side, he says the marketplace is shifting in ways that will benefit Bado and Levins. First and foremost, the Internet has become the de facto common platform. Sales, marketing and service are going online, and Web-enabling CRM software is primarily a technical issue with an achievable goal, Thompson notes.

It will be more difficult, Thompson says, to stretch the electronic links that bind your employees and customers to include suppliers and partners. This extended enterprise, as Thompson dubs it, must deal with security and cultural issues as well as technical issues. He says it will be a few years before you'll see an Internet-based CRM system used by everyone with ties to a company.

An extended enterprise is just what Jeff Ehret wants. Ehret is engineering manager of configuration systems at Holophane Corp., a Columbus, Ohio-based manufacturer of commercial, industrial and roadway lighting. His company does a lot of business through distributors and has strong ties to the suppliers that provide the aluminum, wire and other materials for Holophane's just-in-time manufacturing process. He says he'd like to bring them into his CRM system, which now consists of North Vancouver, British Columbia-based Pivotal Corp.'s Relationship 99 customer management suite for core capabilities, enhanced by Toronto-based SalesLogix Corp.'s CommerceLogix configurator for on-the-spot product customization.

Ehret's expansion plans include the ability to dynamically generate the materials bill when a salesperson books an order, breaking down each item into its constituent raw materials, like aluminum and wire, and sending the materials order right to the supplier.

New Partnerships

Right now, links to his manufacturing floor convey only the actual item the customer ordered, so another step is required to get the supplies needed to make up the order. He says he'd also like to forge closer ties with his channel partners, so a distributor's customer becomes his customer and vice versa.

Ehret says one thing that would help Holophane become an extended enterprise is quicker, easier integration among his CRM software and other applications, like manufacturing control. He wants to see open application programming interfaces (API) based on a standard. The vendor-specific ones he has been using to meld together his infrastructure always need tweaking; what works during the first integration project doesn't transfer to the next, he says.

Recent Releases

In the past seven months, vendors like Siebel Systems, Clarify, Vantive Corp. in Santa Clara, Calif., and Pivotal have extended and upgraded their software with the following elements:

- **BROWSER-BASED INTERFACES** for ubiquitous corporate access to customer relationship management (CRM) applications.
- **NEW FEATURES** for providing sales, support and marketing to customers through a Web site.
- **SYNCHRONIZATION CAPABILITIES** to share data among CRM suites and desktop applications, personal information managers and personal digital assistants.
- **INTEGRATION HOOKS TO LINK** front-office CRM suites with back-office installations.
- **SPECIALTY APPLICATIONS** for tasks like configuring highly complex products, creating customized sales pitches and training sales staff.

Those APIs are in the works. "More and more of the integration points are being productized and standardized so they're less custom," says Chris Martins, an analyst at Aberdeen Group Inc., a consulting firm in Boston.

Integration with other applications is also important to Levins. If Clarify can't supply a module that does the job he needs, he says he will bring in another package. Being able to integrate that application with Clarify, which he describes as the backbone of his CRM infrastructure, allows him to be flexible and add capabilities as the needs of his business change. And Levins knows that tomorrow's CRM requirements will be different from today's. "What the needs are today, I didn't know about a year ago," he says. ◗

Johnson is a freelance writer in Seattle. Contact her at amyhelen@pobox.com.

ENABLING THE TEAM APPROACH

- **PRIMARY GOAL:** Organized around three-person sales teams; when one of them talked to a customer, everyone on the team knew about it.
- **KEY FINDING:** New workflow allows the team to be proactive about contacting customers with opportunities.
- **GREATEST BENEFIT?** User knows who on the team is most responsible for the customer's business.

When a pension fund manager wants some investment advice from his sales team at Everen Securities Inc., a Chicago-based brokerage house, it doesn't matter which member of the team he contacts. Talking to the research analyst is the same as talking to his account manager or his trader; all three know everything about the account – current holdings, past trades, the gist of recent conversations he's had with any of them. All that information is stored in a central Informix Corp. database and shared among the sales team through the company's Vantive customer relationship management suite.

Since installing Vantive Sales and Vantive Support in May 1997, the institutional equities arm of Everen Securities has achieved its primary goal: relieving the sales team of cumbersome data-handling chores. "We want to take the sales rep out of technology and put them in sales mode," says Michael Roman, vice president of business analysis at Everen.

So now all the new data-entry screens in Vantive are filled with as much information about a client as possible – a key factor in deciding to pick Vantive over its rivals, Roman says. New research reports hit the sales staff's desktops instantaneously, and searching and sorting has never been easier.

Since the first two packages went live, Everen has gradually expanded its Vantive installation, adding pieces that offer corporate finance, groupware and mail-merge marketing capabilities. Vantive's modularity is a major benefit, Roman says. End users enjoy what appears to be a highly functional single-screen application, while the information technology department benefits from the reduced maintenance and low overhead of an integrated suite and a single database.

Although Vantive has enabled Everen's sales teams to be more productive, Roman says he sees ways the software can help his people become more proactive about serving customers. His goals are to push relevant data at the account managers and to configure triggers in the software to generate sales and marketing materials when certain events occur.

For example, Roman says he would like to see call lists sitting in each account representative's in-box every morning, automatically generated by Vantive based on market movements and the contents of research reports keyed into the system. Then the sales teams could call clients and let them know about lucrative buying and selling opportunities.

But the current business rules within Vantive reflect the company's workflow, not the data flow. And to change that, Everen would have to add a layer onto that workflow and expand security levels. Other ideas he says he'd like to implement include direct marketing through the Web and building an event-triggered update system that alerts clients to current market conditions via e-mail.

Most of the changes Roman wants to see are possible to execute today but are sitting on the back burner, because the company is in the middle of a merger. When he has launched a Vantive project, however, he says he's been pleasantly surprised by the results. Case in point: integrating Novell Inc. GroupWise into Vantive. He scheduled six weeks for the task; the team was done in two.

– Amy Helen Johnson

IBM Enters The PC Market

With a base price of $1,565, 64K bytes of RAM and a processor speed of 4.77 MHz

BY STEFANIE MCCANN

On Dec. 2, 1980, IBM's Dave Bradley arrived at the front door of Microsoft Corp. to hand-deliver the first IBM PC. Microsoft's Steve Balmer opened the door to find Bradley standing there with nine very large boxes and holding the motherboard that he had carried onto the plane. The joint IBM/Microsoft team spent the next two days putting the PC back together.

Bradley, today a senior technical staff member at IBM's Personal Systems Institute, was an original member of the IBM PC development team. He needed to get the PC to Microsoft so it could install the 16-bit operating system, DOS — the original operating system for the IBM PC (see story at right).

The IBM PC was released eight months after Bradley arrived on Microsoft's doorstep — Aug. 12, 1981. The base price was $1,565. It had 64K bytes on the system board and up to 640K with expansion boards.

Open Architecture

The processor was an Intel 8088 running at 4.77 MHz. The new machine had an open architecture that made cloning the PC possible. Clones began to appear the following year.

IBM was very quiet while the PC was in development. "It was an interesting time. . . . I didn't even talk to members of my softball team," says Bradley, who belonged to the IBM softball league at that time.

But the secrecy surrounding IBM's PC didn't appear to concern Apple Computer Inc. Company executives didn't seem to view IBM's entry into the PC market as a threat. The day after IBM released the PC, Apple ran a full-page advertisement in *The Wall Street Journal* that read "Welcome IBM, seriously."

IBM's offering gave the personal computer further credibility, helping to broaden its use in the business world.

IBM far exceeded its projections of how many users would want one of its PCs. "I knew it was a good machine, but I didn't think it was going to be a landslide," Bradley says. The company couldn't keep up with the demand. "We didn't predict the future very well, and we were astonished. We thought it would be successful, but not that successful," he adds. ◗

THE IBM PC, running DOS, was unveiled on Aug. 12, 1981

MS-DOS

Microsoft's Destiny

The PC is mated to Microsoft's DOS

BY STEFANIE MCCANN

When IBM was looking for an operating system to put on its developing PC, the first thought was to use Digital Research Inc.'s CP/M — the standard PC operating system at the time. Digital turned IBM down.

In 1980, IBM went to Microsoft Corp. and offered the company the chance to develop an operating system for the PC. Microsoft went out and purchased QDOS from Seattle Computer Products, intending to use the operating system to fulfill IBM's request.

That was the beginning of a long-term partnership between Microsoft and IBM.

To further help with the development of DOS, Microsoft hired Tim Paterson, who was the chief engineer at Seattle Computer Products.

That first version was designed specifically for the IBM PC. By July 1981, IBM PC DOS 1.0 was ready to run on the IBM PC. ◗

McCann is Computerworld's *QuickStudy editor.*

1981

The **Arpanet** now has 213 hosts and adds another one roughly every 20 days.

High school student **Steve Mann** designs a backpack-mounted **6502 computer** (used in the Apple II) to control photographic equipment. The display is a camera viewfinder CRT attached to a helmet; lead-acid batteries power the entire system.

BBN Advanced Computers Inc. develops the **Butterfly** – a parallel computer that can combine up to 256 processors to achieve single-program parallel processing.

Ashton-Tate Corp. ships **dBase II,** the early industry-standard database program.

CSNET (Computer Science Network) is built with seed money granted by the National Science Foundation to provide networking services (especially e-mail) to university scientists with no access to Arpanet.

Larry Boucher founds Adaptec Inc. ▸

The Rev. Ron Jaenisch performs the first **computer wedding.** The computer used is an Apple II; the bride and groom indicate "I do" by using the "y" key.

BITNET (Because It's Time Network), one of the first international, wide-area networks, is established.

Steve Grimm and Nikolai Weaver start **Plum Software** in Los Gatos, Calif. Their first product is a program called Filewriter. The two are 11 years old.

Xerox Corp. introduces the **Star** personal computer, a commercial version of the Alto. The computer features a new way of presenting file data, depicting documents with icons of "files" and "folders" scattered on a "desktop." It also includes an electronic pointer called a "mouse" and a network that lets users share information. Steve Jobs viewed an earlier version when he visited Parc in 1979; Microsoft Corp. bought one to study.

Joe Celho and **Jackie McDonald** publish an article called "Father Time Software Secrets Allow Updating of Dates" in the Feb. 9 issue of *Information Systems News.* The article is a tongue-in-cheek proposal for a new company that would make tons of money in the year 2000 by correcting programs and data that use two-digit year fields. "We will charge fantastic fees for our services," reads the article, "and clients will have no choice but to pay."

Adam Osborne completes **the first portable computer,** the Osborne I, which weighs 24 pounds and costs $1,795. The machine includes software worth about $1,500 and features a 5-in. display, 64K bytes of memory, a modem and two 5 1/4-in. floppy-disk drives. ▸

Ian Murphy, a 23-year-old who calls himself **Captain Zap,** breaks in to computer systems at the White House, the Pentagon and BellSouth Corp. and deliberately leaves his résumé.

Apollo Computer introduces the first workstation, the DN100. It offers more power than some minicomputers at a fraction of the price. ▸

Microsoft reorganizes into a privately held company called **Microsoft Inc.,** with Bill Gates as president and chairman and Paul Allen as executive vice president.

Novell Inc. hires **SuperSet Software** to create software to link computers together.

Mike Markkula takes over as president and CEO of Apple Computer Inc.

Sony Corp. introduces a 3.5-in. micro-floppy drive.

VisiCalc is available for the IBM PC.

Hayes Microcomputer Products Inc. introduces the Smartmodem 300, which will become an industry standard.

Georges Guillaume's restaurant in Valenciennes, France, installs computer keyboards at each table. Customers can place orders for bar, entree or appetizer menus by pushing buttons for their choices.

Steve Jobs is featured on the cover of *Inc.* magazine's October issue.

The **ENIAC** and a Radio Shack **TRS-80** square off to see which can square all integers between 1 and 10,000 the fastest. The TRS-80 wins, completing the calculation in one-third of one second. The Electronic Numeric Integrator and Calculator takes six seconds.

A man is killed while working in a Japanese factory, when an out-of-control robot crushes him.

Compiled by Laura Hunt, Computerworld*'s corporate librarian*

Flashback is produced with the assistance of The Computer Museum History Center in Mountain View, Calif.

Virginia's New Dominion

Northern Virginia's Silicon Dominion is home to high-tech firms that offer work in every facet of IT

By Kim Fulcher Linkins

ANNA FRAME, COURTESY OF THE CITY OF ALEXANDRIA

QUEEN STREET in Old Town, Alexandria

NORTHERN Virginia is hosting more Internet start-ups, hardware or software companies and other high-tech firms than ever before. So much so, in fact, that the area has become known as the "Silicon Dominion."

"Here in Virginia, they saw the writing on the wall and I think made it very attractive to entrepreneurs as well as chairmen of the board to relocate or create their companies here," says Don Resh, a consultant at Compuware Corp. in Alexandria, Va.

Companies in telecommunications; Internet applications; systems development, integration and implementation; and the chemical and biomedical industries have all either relocated or created offices in Northern Virginia. The area is also home to nonprofit agencies and, of course, government agencies.

Information technology professionals working in almost any area can find positions in cities such as Arlington, Alexandria, Falls Church, Fairfax and McLean. Area companies list openings for programmers, Internet engineers, programmer/analysts, database administrators, consultants, network professionals, systems managers, Internet technology developers, Windows NT engineers, Web developers, Oracle professionals and software engineers. There's a strong demand for IT professionals with experience with C, C++, Java, HTML, TCP/IP, Unix, Visual Basic, PowerBuilder and packaged software like SAP, Oracle Financials and PeopleSoft.

IT professionals applying to the government agencies in the area may face background checks as a prerequisite to permanent employment.

For example, Don Essick, a senior consultant at Arlington-based Logicon Syscon, a subsidiary of Northrop Grumman Corp., works with the Drug Enforcement Administration, so he and his co-workers have faced extensive background checks. "It takes six to nine months [to] get a badge; you have to be signed in to the building, and you can't work on anything that involves sensitive information," Essick says. "Some people get discouraged after being here four and five months and having to be escorted to the bathroom."

If a person does get discouraged and decides to look for another IT job in Northern Virginia, experts say the search is relatively easy.

"With [the area] being such a hotbed for technology, the demand for people is extraordinary," says Bill Ledman, senior vice president of information systems services at Freddie Mac in McLean.

"In Northern Virginia, there's virtually no unemployment in the technology field. The turnover in the area can be fairly high because people are recruited heavily," he says. "If you aren't compensating them well, if you don't have a very good benefits package, if you aren't managing them well and treating them well, frankly, you'll lose them because someone else will take them."

In order to counter such job-hopping, companies are trying to offer salaries and compensation packages designed to cater to the needs of employees and their families.

"They're really getting good with the health care, stock options, things like that. I think they're also offering a great deal of training that people find very attractive," Resh says. "Businesses are trying to create more of a family atmosphere for employees to work in" by sponsoring picnics and making the corporate culture more familylike, he says.

Plus, the money being offered in the area is a major draw. For a college graduate with no special skills, the average starting salary is $26,000 or $27,000 per year, Ledman says. With a computer degree, new graduates may garner $45,000 per year, says Rich Boornazian, vice president and CIO at Long & Foster Real Estate in Fairfax.

> "
> Once you get here, you'll have no trouble getting a job.
>
> DON RESH,
> COMPUWARE CORP.

On the job, IT experts say the environment can vary from company to company. There are formal and businesslike companies, but Resh says, "We're seeing more and more businesses here that look like our California counterparts, where it's very casual. The hours that you work can be very flexible."

Because of the area's proximity to Washington, many people in Northern Virginia enjoy the amenities offered by the nation's capital.

If you have some good basic skills and want to move to Northern Virginia, "just do it," Resh advises, "because you'll find once you get here, you'll have no trouble getting a job."

To narrow the field of options, IT professionals need to educate themselves about potential employers in order to find a good fit between their own skills and a potential employer's direction, says William Robertson, senior director for customer services at The American Red Cross in Falls Church. ◗

Fulcher Linkins is a freelance writer in Austin, Texas. She can be contacted at kplinkins@aol.com.

POINTS SOUTH

Richmond offers IT pros the same kinds of opportunities as its neighbors in Northern Virginia, a mild climate and a more bucolic setting

Possibly thought of in the past as only a nice country town, Richmond is increasingly becoming a high-tech powerhouse. Home to such companies as Reynolds Metals Co. and Phillip Morris Cos., as well as more and more companies in the financial, retail, transportation and semiconductor industries, Richmond is beginning to attract large numbers of IT professionals.

"It's not difficult to entice people from the north to live down here," says Steve Hanes (*shane@vafb.com*), director of information services at the Virginia Farm Bureau. "I think the pace of life is a little slower, and the weather is great, so you've got those kinds of recruiting edges. Especially during the winter when somebody's up to their neck in snow, a place like this can look pretty good. There's a lot of transplanted Yankees down here."

With openings for systems programmers, application programmers, network specialists, people with NT skills, Microsoft Certified Systems Engineers and Cobol professionals, as well as IT professionals skilled in e-commerce and enterprise applications like SAP and J. D. Edwards, Richmond offers IT professionals a wide range of opportunities, experts say.

Entry-level IT pros can expect to earn $25,000 to $35,000 per year, experts say. For the more experienced, such as programmers with knowledge of operating software like SAP, for example, salaries may range from $40,000 to $60,000 per year, says Mark Smith (*mark.smith@sscoop.com*), director of data center operations at Southern States Cooperative. An electronic data interchange manager or e-commerce manager can expect to earn from $50,000 to $75,000 annually, he says.

The city itself has much to offer individuals during their off-work time, locals say.

"It's a nice, moderate climate. You can go almost two hours in any direction and find almost anything that you want, whether it's skiing in the mountains or going to the beach," says John Rudin, vice president and CIO at Reynolds Metals. And it's only two hours to Washington.

– Kim Fulcher Linkins

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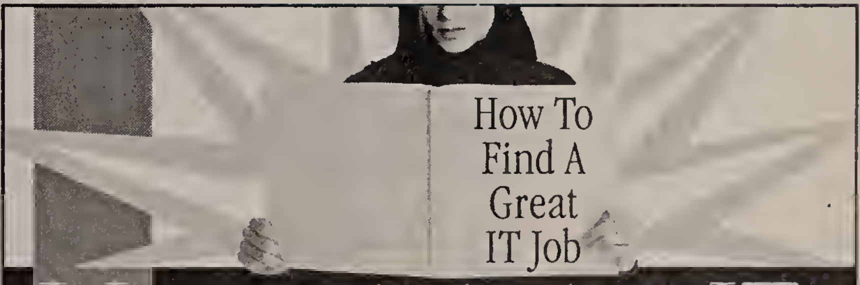

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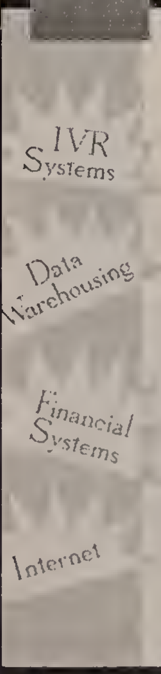

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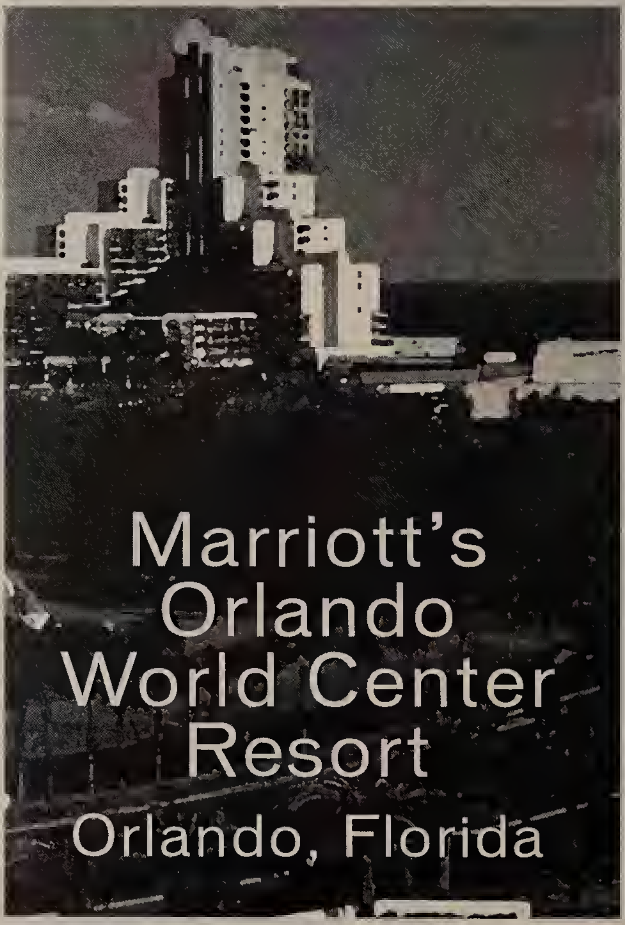

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- Maintain user ID access request database
- Create an access type template for each group of users that access the IBM mainframe
- Set up security administrators
- Assist security administrators with user problems and questions
- Maintain the audit system on a daily basis

Requirements:
- Technical degree or equivalent technical experience
- Two to three years' experience with mainframe environment (MVS)
- Proficient in TSO, ISPF and IBM Utilities
- Solid trouble-shooting skills
- Two to three years' RACF experience or mainframe security product (ACF2 or TOP SECRET) experience is preferred

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For immediate consideration, please forward your resume and salary history referencing code, **99A-CWD013**. **Via the Internet at:** www.ac.com/careers/jobs. **Via mail:** Andersen Consulting, Americas Recruiting Center, Attn: **99A-CWD013**, P.O. Box 7305, Chicago, IL 60680-7305. **Via fax: (800) 762-5796**, Attn: **99A-CWD013**. No phone calls, please. Visit our Web site at www.ac.com. Andersen Consulting is an Equal Opportunity Employer. ©1999 Andersen Consulting. All trademarks are the property of their respective owners.

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Full-time Senior Business Systems Consultant to install, implement, train, analyze problems, resolve problems with BPCS (Business Partners Application Software) applications software as well as develop, design and program systems for the IBM AS/400 computer system (upgraded from IBM System/38). Assist customers to migrate the application software to be century compliant. Train customers in the use of the new century compliant software. Provide training to the company's customers in all aspects of the BPCS software. Provide implementation assistance to the company's customers with all their application software. Assist customers to develop and interface their applications with non IBM AS/400 computer systems. Train company's staff. Design new or enhanced systems for customers as required by the customer. Provide consulting to company's customers in the area of BPCS financials, logistics and manufacturing as well as IBM AS/400 systems and IBM AS/400 RPG and CLP programming. Design, write, implement and operate application software for the IBM AS/400 computers. Provide presales support and assistance when selling the company's services and products. Provide training and implementation support for the application development tools: AS/SET and IMPLEMENTOR. Must have four years of experience in the job offered or four years of experience in a position with same duties. Salary $84,000/yr. Send resume to: Ulrich Delano Wartes, Assignment 400 Group, Inc., 1230 Johnson Ferry Rd., Suite I-20, Marietta, GA 30068.

Systems Analyst needed by E. Northport, NY Co. involved in the Healthcare Industry. Must have BS degree & 3 yrs experience. Respond to: HR Dept, Neometrics, Inc. 104 Bellerose Ave, E. Northport, NY 11731.

Full-time Quality Assurance Manager, Migration/Reverse Engineering Group: Responsibilities include: Manage Quality Assurance of Software developed offshore and implemented in the U.S.; manage testing; manage the evaluation and installation of test tools for ES 9000 mainframe using C Programming, Visual Basic Programming, MVS, Job Control Language (JCL) and CICS; manage the design, development and implementation of various testing methodologies and reusable test suites; manage and analyze testing metrics; manage the strategic and tactical development of testing processes; manage other team managers and support staff; plan, monitor and prepare status reports; audit application quality to ensure adherence to Quality Management Systems; manage user acceptance tests and user training; serve as chief liaison between client and Director of Migration/Reverse Engineering; must have a Master of Science degree or foreign equivalent in Computer Applications and three (3) years of experience in software engineering or a Bachelor of Science degree or foreign equivalent in Computer Applications and at least five (5) years of experience in software engineering; must be willing to travel to client sites Monday-Friday. Must have proof of legal authority to work in the United States. Salary Range: $68,187.00 to $80,000.00 per year. If interested, submit resume in duplicate or apply in person:

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Atlanta, Georgia 30338

SYSTEMS ANALYST

Watson Clinic LLP, a renowned multi-specialty physician group practice located in Lakeland, Florida is currently seeking a Systems Analyst. Requirements include a Bachelor's degree in Computer Science (or equivalent work experience), 3+ years programming experience, and a minimum of 1 year experience in the customer analyst/application design phase of program development. Cyborg experience a plus.

We are offering a competitive salary and comprehensive benefits package. Watson Clinic LLP is a quiet strength in this exceptional Central Florida community, where you will enjoy a relaxed suburban lifestyle, offering easy access to both Orlando and Tampa. For consideration, please respond to: WATSON CLINIC LLP, Human Resources, 1430 Lakeland Hills Blvd., Lakeland, FL 33805. Phone (800) 356-5736 or fax (941) 680-7598. EOE.

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Oracle Applications Senior Consultant. Job location: Conshohocken, PA. Duties: Resp. for gathering business requirements, developing current assessment, future state design, gap analysis & requirements analysis. Perform implementation, integration & set-up of Oracle distribution & mfg. Systems using Oracle Manufacturing Applications. Create reports, interfaces with production systems & conversions from legacy systems using PL/SOL, Designer 2000, Developer 2000 and SOL*Plus. Resp. for re-engineering business processes & integrating with legacy systems. Analyze and set-up security systems within the Oracle Financials & Oracle Mfg. systems using menus, security profiles and forms. Configure applications for systems using Oracle 7.0, PL/ SQL, SOL*PLUS & Windows NT. Requires: M.S. in Comp. or Info. Sci., Eng. or related field and 3 yrs. exp. in the job offered or 3 yrs. exp. as a Consultant, Systems Analyst or Eng. Will accept B.S. or equiv. & 5 yrs. of progressive exp. in the computer ind. Exp., which may have been obtained concurrently, must incl.: 3 yrs. exp. performing implementation, integration and set-up of Oracle Mfg. systems & 3 yrs. exp. using Oracle and PL/SOL. EOE. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Salary: $78,000/yr. Send resume (no calls) to: Carrie Shevlin, AnswerThink Consulting Group, 3200 Windy Hill Rd., Suite 800 West, Atlanta, GA 30339. Must have legal auth. To work in U.S.

Oracle Applications Senior Consultant. Job location: Conshohocken, PA. Duties: Design, implement, integrate & set-up Oracle Applications & Client/Server solutions using Oracle/solutions methodology. Analyze, design & develop customizations, reports, interfaces with production systems & conversions from legacy systems using Oracle Database 7.x and 8.x, Oracle Web Application Server 3.x, SQL, PL/SOL, Developer 2000, SOL*Plus and Reports 2.5 Administer & upgrade Oracle Database Server & Oracle web server & perform system administration of Oracle Application system. Analyze Data Warehouse structure & create reports based on OLAP architecture using Crystal reports. Analyze & map business requirements into application functions using systems analysis and modeling techniques. Requires: M.S. in Comp. or Info. Sci., Eng. or related field and 3 yrs. exp. in the job offered or 3 yrs. exp. as a Software Eng. or Programmer Analyst. Exp., which may have been obtained concurrently, must incl.: 2 yrs. exp. designing & performing implementation, integration & set-up of Oracle applications, 2 yrs. exp. administering and upgrading Oracle database server and 2 yrs. exp. using Oracle Database, Developer 2000 & PL/SOL. EOE. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Salary: $80,000/yr. Send resume (no calls) to: Carrie Shevlin, AnswerThink Consulting Group, 3200 Windy Hill Rd., Suite 800 West, Atlanta, GA 30339. Must have legal auth. to work in U.S.

Software Engineer to direct, create & implement a Systems Monitoring Console product to monitor geographically distributed field sites where IBM products are deployed. Resp. for the development of system using RS6000, AIX and Web Based (browser based). Create custom SNMP agents to report status on telecom switches using C and Tel 6K lines. Create custom MIB applications to report on SNMP alarms. Engage in the ongoing creation of original designs from ideas for implementation through the system life cycle process using Java, Visual Age, DB2, Oracle, SOL, TCL, C and C++. Perform tests on newly created applications to ensure stability. Analyze system performance problems & produce performance reports detailing problems and possible solutions and then implement solutions. Requires: 5 yrs. exp. in the job offered or 5 yrs. exp. as a Tech. Consultant or Systems Administrator. Exp., which may have been obtained concurrently, must incl.: 4 yrs. exp. creating systems monitoring console products, 4 yrs. exp. analyzing system performance problems & producing reports detailing problems & solutions and 4 yrs. exp. using RS6000, Java and DB2. EOE. 40 hrs/wk.; 8:00 a.m. to 5:00 p.m. Salary: $75,000/yr. Send resume (no calls) to: Praneeta Stone, CTG, Inc., 13665 Dulles Technology Dr., Suite 120, Herndon, VA 20171-4603.

SOFTWARE ENGINEER to provide on-site consultancy to analyze, design, develop, test, implement and tune business application software using Visual Basic, C++, VC++, Sql Server and Oracle; prepare detailed specifications and prototypes; develop application software; test plans, testing and documentation preparation; use RDO and ODBC for database connectivity, Crystal Reports for all reporting purposes and interfaces with hardware devices such as PIN Pad and card readers for frontdesk data communication. Require: M.S. in Electronics/ Computer Science and two years experience in the job offered or as Programmer/Analyst. 40% travel to client sites within the United States required. Salary: $62,000 per year, 8:30 am to 5:00 pm, M-F. Apply with resume to: President, YASH Technologies, Inc., 2100 Parklake Drive, NE, Suite F, Atlanta, GA 30345-2167.

Needed Project Manager for our Pennsylvania and New Jersey locations to manage & implement web based/commercial applications for manufacturing, financial, human resources in a UNIX/Windows NT environment using ORACLE/SYBASE as a relational database management system. Re-engineer existing legacy applications to client server architecture using GUI tools such as PowerBuilder & Developer 2000 in the design and development process. Implement e-commerce applications using JavaScript/Active Server Pages. Utilize proprietary case tools such as ERWIN for data modeling. Utilize SOL query optimization & PL/SOL for data loading/aggregation. High mobility. Min Req: B.S. in C.S/Electronics or related field or equivalent & 5+ yrs. of progressive work exp. or Masters Degree in MIS Engg. or related field + 2 yrs. of exp. Exp. to include use of UNIX, Windows NT, ORACLE, JavaScript, Active Server Pages, ERWIN, PowerBuilder or Developer 2000. Salary: 85,000/yr and 40 hrs/wk. Must have authority to work in U.S. Send resume to Root Consulting, 1500 Market Street, 12th Flr East Tower, Philadelphia, PA 19102 or Root Consulting 120 Wood Ave. So., Iselin, NJ 08830.

SENIOR PROGRAMMER/ANALYST to analyze, design, develop, test, implement and support application software for the healthcare industry using Visual Basic, RDBMS, SOL, Crystal Reports, Data Access technologies such as DAO or ADO, Active-X, API and Version Control under Windows NT operating systems; Maintain existing customer code. Require: Master's degree in Computer Science/Engineering, or a closely related field. Must have a demonstrated ability to perform stated duties gained through previous work experience/academic coursework and projects. Salary: $55,000 per year, 8 am to 5 pm, M-F. Send resume to: Gregory P. Ferguson, President, Kreg Corporation, 8 Piedmont Center, Suite 412, Atlanta, GA 30305; Attn: Job TS.

SOFTWARE ENGINEER to provide on-site consulting services to analyze, design, develop, test, implement and maintain application software for enterprise wide custom client/server systems using object oriented programming, GUI tools such as Oracle Forms and Oracle Reports, Designer 2000, Crystal Reports and Gupta SOL on UNIX and Windows; develop internet and intranet applications using HTML and JavaScript. Require: B.S. in Computer Science or Electronics Engineering and four years experience in the job offered or as Software Consultant/Programmer/Analyst. 40% travel required to client sites within the United States. Salary: $75,000 per year, 8:30 am to 5 pm, M-F. Apply with resume to: Director of Staffing, Enterprises Computing Services, Inc., 8744 Main Street, Suite 101, Woodstock, GA 30188.

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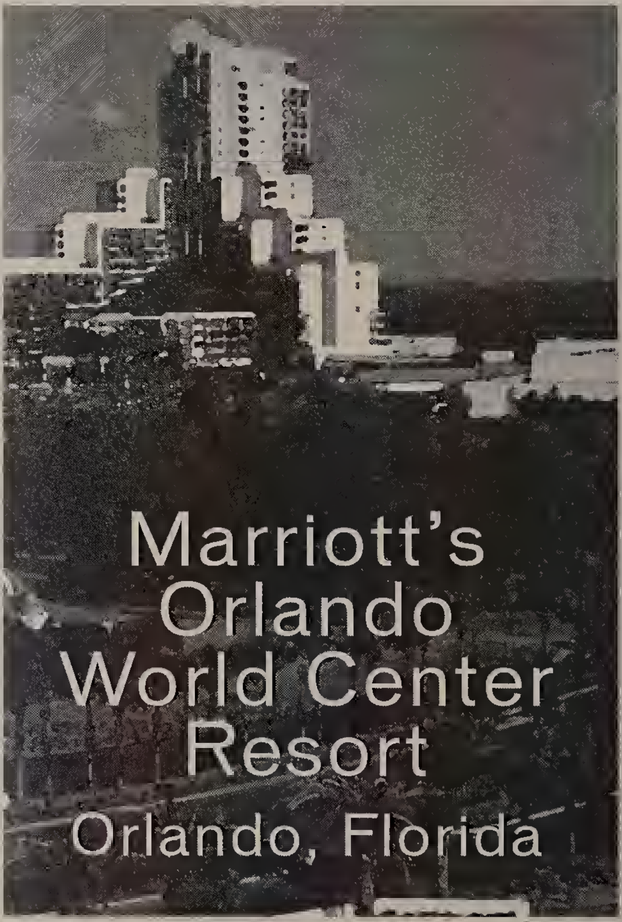

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SOFTWARE ENGINEER (Image Processing Systems) Lead role in design and development of image processing systems in client-/server environment using iCR and OCR engines and other pattern recognition libraries, implement imaging projects requiring technologies such as C++, CORBA, ORBIX, OLE, COM and DCOM using backend databases Oracle 7.3X and ODBC, Internet/Intranet technologies NSAPI, Domino and LsxODBC, Java on UNIX and Windows Platforms. MS degree in Comp. Science/Rel. Field with 2 yrs. experience in Job offered above; Alternately, B.S. in Comp. Sc/Rel. field, and 5 yrs. progressively challenging exp. as follows is accepted: (1) 1 yr. exp. in software engg./systems analysis and/or programming; (2) 1 yr. exp. in Object Oriented methodologies with User interface development (3) 1 yr. exp. in development of client/server systems using pattern recognition and intelligent character recognition libraries; (4) 1 yr. exp. in developing and directing software testing procedures documentation; (5) 1 yr. exp. in a lead role in developing apps using iCR, OCR, and OLE and rel. tools in job offered. 2 Positions. $70,000/yr. Reply to Job Code 56/99.

SENIOR BUSINESS ANALYST (ERP Applications) Analyze, design, & develop custom reports for MM, SD, FICO & PP modules, modify existing reports using SAP enhancement techniques like User exits, Menu exits, Program exits. Responsibilities include design, develop, test interfaces and conversions using BDC, call transaction, IDOCS, and data extraction methods in SD, FICO, MM and PP modules, Data mapping of Legacy to SAP. Create and modify layout sets using SAP scripts. Develop and test interfaces; Create and modify data dictionary objects such as tables & domains. Design & develop Reports, Sessions, create new tables, modify existing tables using Triton/Baan tools in Sales/Distribution, Finance & Manufacturing modules; Install Baan software. M.S. Computer Science/MBA and 2 yrs exp. in job offered. $85,000/yr. 3 positions. Reply to Job Code 57/99.

Benefits: major medical for self, vacation, and sick leave for all positions; These are consulting positions and travel/stay at client locations within the US required, Applicants having proof of legal authority to work in U.S. respond to Attention: VP (Technical), Software Solutions Group, Inc. 3300 Buckeye Rd., Suite 555, Atlanta, Georgia 30341, Phone (770) 455-9009 Ext. (23); Fax (770) 455-6463 or e-mail at SSG@mindspring.com. AN EOUAL OPPORTUNITY EMPLOYER.

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Consultant/Sr. Software Engineer: Design, develop and debug Component Software including Distributed Object Oriented Development and thin client/internet applications using Java, C++, CORBA (Orbix) and RDBMS; troubleshoot RDBMS/CORBA administration related problems; teach Java & CORBA to clients; perform unit testing and system integration testing using Automated Testing Tools. Utilize Java, Orbix and Automated Testing Tools. Knowledge of: C, C++, Java, SOL, PL/SOL, Oracle RDBMS, Solaris, HP-UX, Orbix, Automated Testing Tools, Windows 95/NT, Informix RDBMS and Distributed Object Oriented Development. Master of Science in Computer Science AND 2 yrs. exp. or 2 yrs. exp. as a Software Enginéer. M-F, 9-5, 40 hrs/wk., $71,926.40 per yr. Send 2 resumes to Case # 19982073, P.O. Box 8968, Boston, MA 02114.

Oracle Applications Senior Consultant. Job location: Conshohocken, PA. Duties: Analyze, design and perform implementation, integration and set-up of Oracle Applications using Visio, PL/SOL and Developer 2000. Design and develop forms, reports, custom extensions to production systems and conversions from legacy systems using PL/SOL and Oracle 7.x. Analyze client's business processes and bridge gaps using Oracle Applications. Requires: M.S. (or foreign equiv.) in Comp. or Info. Sci., Eng. or related field and 3 yrs. exp. in the job offered or 3 yrs. exp. as a Consultant or Systems Analyst. Exp., which may have been obtained concurrently, must incl.: 3 yrs. exp. analyzing and designing the set-up of Oracle Applications and 3 yrs. exp. using Oracle, Visio and PL/SOL. EOE. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Salary: $92,500/yr. Send resume (no calls) to: Carrie Shevlin, AnswerThink Consulting Group, 3200 Windy Hill Rd., Suite 800 West, Atlanta, GA 30339. Must have legal auth. to work in U.S.

Multiple openings w/NJ IT firm: - Software Engineers - Must have Masters in Comp Sc or IS or engrg w/3 yrs of exp. as Software Engrs or in related occupations as Progs or Systems Analysts. Alternately, those w/Bachelors in Comp Sc or IS or engrg should have 5 yrs of exp as Software Engrs or as Prog Anlysts. - PROG ANALYST - Bachelors in any field w/2 yrs exp as P/A or as Progs. A variety of skill sets required. Qualified candidates should 2 resume: HR Dept, 1 Lincoln Highway, Suite 16, Edison, NJ 08820

Principal Software Engineer needed by Software & Hardware Mftr in Marlboro, MA. Must have MS in Comp Sci, Engg or related field or equiv and 1 yr exp in video effects & video processing hardware & C++. Respond by resume to: HR Dept., Media 100, inc., 290 Donald Lynch Blvd, Marlboro, MA 01752-4748.

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Systems Analyst wanted by multi-language advertising services company in New York City to design and implement Korean MIS Systems. Must have BS in Electrical Engg/Sci. Respond to: HR Dept, Young Rubicam Kang & Lee Advtg, Inc, 315 5th Ave, New York, NY 10016.

Systems Analyst needed by IS/IT Consulting Services Co. in New York City for client locs throughout US. Must have Bach in Comp Sci, Engg and 2 yrs computer experience. Respond to: HR Dept, Intermedia Group, Inc, 5 Hanover Square, 15 Fl, New York, NY 10004.

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Assistant CIM System Architect needed by Portsmouth, NH Co. involved in S/ware Dvlpmt for Electronic Mftrs. Must have Masters or equiv in Comp Sci or Engg related discipline and 4 yrs exp in s/ware dvlpmt. Respond to: HR Dept, Tecnomatix-Unicam, 2 International Dr, Portsmouth, NH 03801/ hr@unicam.com

Sr. Software Engineer needed by Supplier of Chemical Testing Instrumentation in Milford, MA. Must have Ph.D. in Physics, Chemistry or related and 1 yr exp in dsgn & dvlpmt of s/ware for chemical instrumentation. Respond to: Linette Grey, Job code # XJX, Waters Corp., 34 Maple St, Milford, MA 01757.

Programmer/Analyst wanted by Computer Services Co. in New York City. Must have Bach in Comp Sci, Comp Engg or Elec Engg and 6 mos exp analyzing, dsgng & dvlpg comp s/ware using object oriented analysis & dsgn, C/C++ and PowerBuilder w/ORACLE d/base in UNIX envrmt and dvlpg Internet/Intranet applics using HTML & JAVA. Respond to: Shanti Prakash, HR Dept, Concise Design, Inc, 350 5th Ave, #1833, New York, NY 10118

Database Manager wanted by Computer Services Co. in Edison, NJ. Must have Bachelor's deg & 1 yr exp coordinating changes to MS-SQL Server d/base; coding, testing, implmtg & administering d/base. Respond to: HR Dept, Horizon Companies, Inc, 5 Lincoln Hwy, Edison, NJ 08820.

Software Engineer needed by Fairfax, VA Computer Services Co. to work at Middletown, NJ job loc. To perform analysis, dsgn & dvlpmt of comp s/ware using C/C++, Kshell, perl, JAVA and HTML in a UNIX envrmt. Must have Masters in Comp Sci, Comp Engg or Elec. Engg. Respond to: HR Dept, Sun Light Technology, Inc, 3829 Parkland Dr, Fairfax, VA 22033.

Software Engineers needed NJ IT. Co. Must have Bachelors in Engineering (any), Comp. Science, Mathematics or Physics with exp. Dsgn/ dvlp, various software applications using Unix, C, C++ and CASE Tools. Apply to HRD, Glotech Solutions, Inc., 256 Wall Street, Princeton, NJ 08540.

Software Engineer wanted by Computer S/ware Dvlpmt & Consulting Co. in Forest Hills, NY. Must have Masters in Computer Applics or Engineering or Math and 2 yrs exp analyzing, dsgng & dvlpg s/ware system using PeopleSoft Tools under C/S envrmt using Win NT 4.0 platforms. Respond to: HR Dept, Amicus Systems, Inc, 113-25 Queens Blvd, Ste 112, Forest Hills, NY 11375.

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7:45am	**Continental Breakfast & Conference Registration**
8:30am	**General Session:** **SOURCING TECHNIQUES** Cathy Peterson, Romac International
10:00am	**Sponsor Showcase/Coffee Break**
10:45am	**General Session:** **SILENT IMPACT: THE BASIC TENETS OF STAFFING & BOTTOM LINE EFFECTS** Dan Hanyzewski, Mastech Corp.
12:00pm	**Luncheon Keynote**
1:30pm	**General Session:** **DEFENDING THE FORT, RETENTION TECHNIQUES** Joe Andrews, Progress Software
2:45pm	**Sponsor Showcase/Coffee Break**
3:30pm	**General Session:** **CUTTING EDGE TOOLS FOR THE INTERNET RECRUITER** Dr. Bret Hollander, NETRECRUITER
5:00pm	**Program ends**

CONFERENCE REGISTRATION FEE*

On or before August 1, 1999	$350.00
After August 1, 1999	$375.00

* Registration fee includes continental breakfast, lunch, breaks and the complete Conference Resource Guide.

CANCELLATION POLICY:
Cancellations must be received in writing. Cancellations received after August 17, 1999 will be billed for the full amount. There are no refunds for "no shows." Substitutions are permissible and should be made in writing.

SELECTED SESSIONS INCLUDE:

Sourcing Techniques

Cathy Peterson, Romac International

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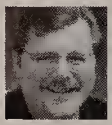

Silent Impact: The Basic Tenets of Staffing & Bottom Line Effects

Dan Hanyzewski, Mastech Corp.

The recruitment organization has a silent but profound impact on the success, or lack thereof, on a corporation's financial performance. So how does the staffing department - a cost center- drive a P&L mentality? Find out more in this key session.

Defending the Fort, Retention Techniques

Joe Andrews, Progress Software

Based on the front-line experiences of an HR executive in a technology company, you'll gain keen insight on some of the winning nonmonetary perks needed to help ensure that your company is the "greener pasture."

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Dr. Bret Hollander, NETRECRUITER

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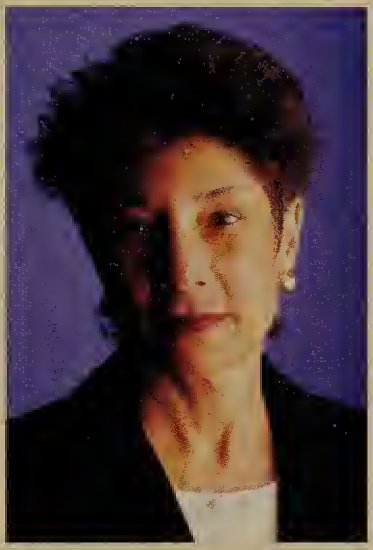

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With a lengthy background in high tech careers and recruiting, Computerworld's CareerAdvisor Fran Quittel specializes in providing in-depth information for job seekers and a "Recruiting Scoreboard" to help employers audit and improve their internal recruiting practices. Fran is author of the book *Firepower: Everything you need to know before and after you lose your job* and is the original creator of The FirePower Career Forum on The Microsoft Network. She also publishes career advice at www.careerbabe.com and tips for employers at www.yourcareer.com

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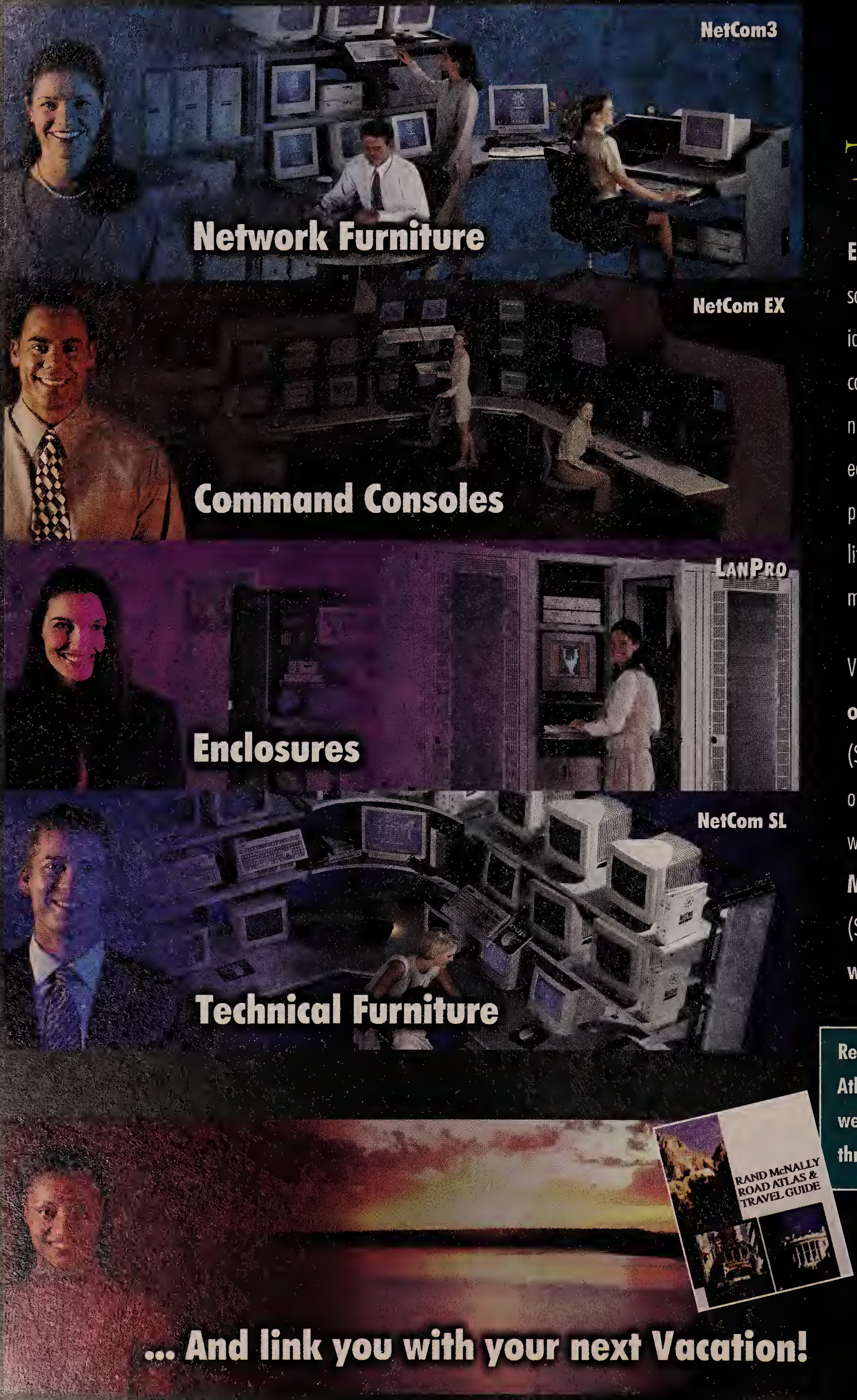

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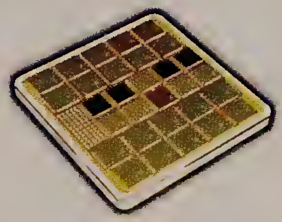

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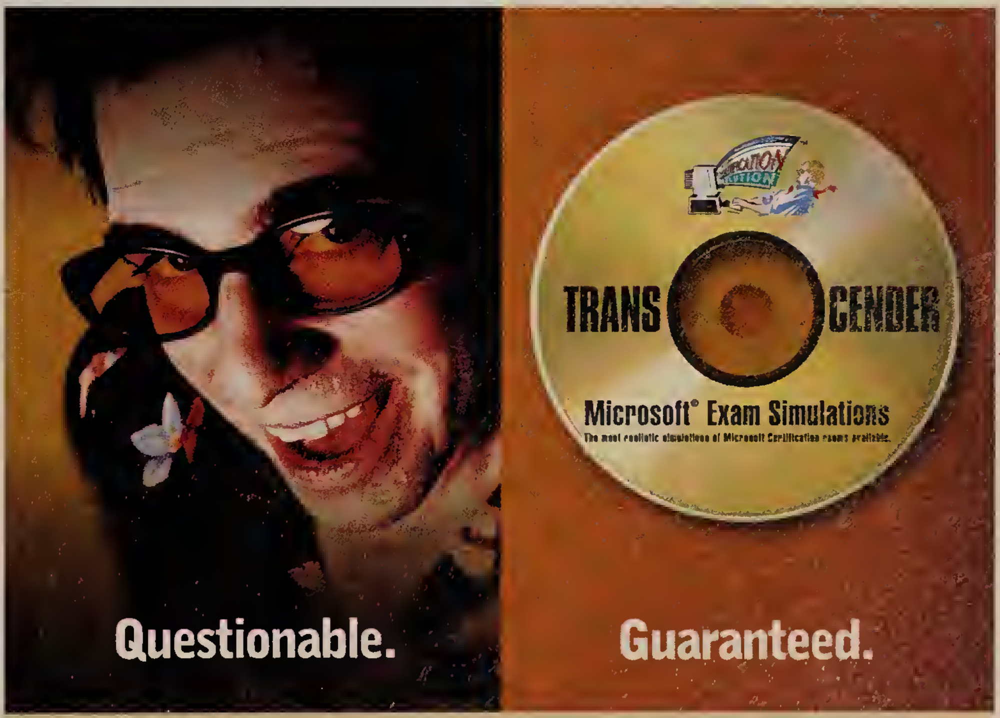

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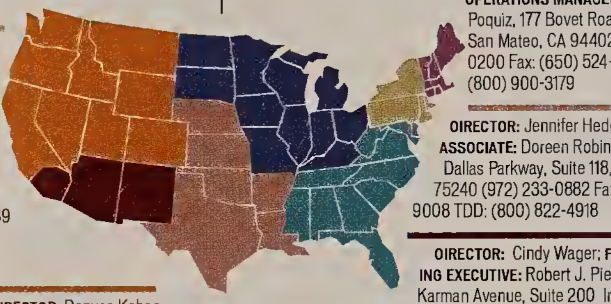

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WEEK IN STOCKS

GAINERS

PERCENT

Data General	37.8
Scientific Atlanta	24.1
Checkfree	20.8
Businesss Objects S.A.	18.6
National Semiconductor	17.7
Pairgain Technologies Inc.	16.5
Uniphase	14.2
Citrix Systems Inc.	13.4

DOLLAR

Uniphase	11.88
America Online Inc.	10.44
Qualcomm Corp.	10.38
Scientific Atlanta	8.69
Sony Corp.	7.94
Xilinx (H)	7.38
Businesss Objects S.A.	7.25
Gateway 2000 Inc.	6.50

LOSERS

PERCENT

Silicon Graphics Inc.	-30.5
@home Corp.	-14.0
Aspen Technology Inc.	-13.5
ECI Telecom	-11.5
Acxiom Corp.	-11.3
Verilink (L)	-10.5
Tech Data	-9.8
Procom Tech Inc.	-9.8

DOLLAR

@home Corp.	-6.13
Teradyne	-5.81
Hewlett-Packard Co.	-5.63
Silicon Graphics Inc.	-5.00
Winstar Communications Inc.	-4.50
Kla Instruments	-4.41
Applied Materials	-4.00
PSINet Inc.	-3.75

Analysts: Red Hat Rides Linux Wave

Its stock offering up 227% at end of first day

BY DOMINIQUE DECKMYN

INITIAL PUBLIC OFFERINGS (IPO) are fading and tech stocks are off lately, but that didn't seem to hurt Linux software vendor Red Hat Software Inc. much. On its first day of trading, its stock closed up 227%, at 52 1/16. Analysts say the Linux market holds opportunities for investments — with some pitfalls.

INDUSTRY ALMANAC

Last year, Linux accounted for 16% of shipments in the server operating system market, according to International Data Corp. (IDC) in Framingham, Mass. And Red Hat is clearly the poster child of the Linux revolution. According to data from IDC, Red Hat holds 44% of paid Linux shipments.

However, the revenue picture is less clear. According to IDC, Linux server shipments in 1998 totaled a mere $34 million — a fraction of Unix's $2.5 billion and Windows NT's $1.4 billion. That may be good news for Linux buyers but not necessarily for Linux investors. "One million copies at $79 apiece — that's millions of dollars, but it's not billions," says Dan Kusnetzky, an IDC analyst.

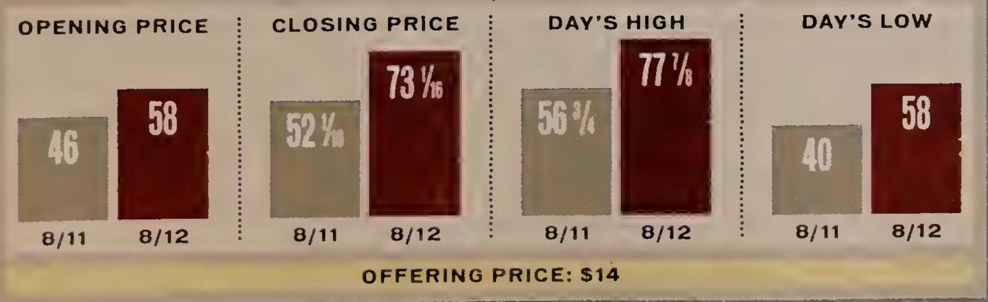
Analysts feel that Red Hat — which almost broke even in 1998 — is well positioned to be very profitable because it is able to sell an operating system with hardly any investments in engineering or even product support. Both are largely taken care of by the open-source community.

Most of Red Hat's $10.8 million in 1998 revenue came from software sales, said Paul Dravis, an analyst at Banc of America Securities LLC in San Francisco. He said that Red Hat will have to derive more of its income from services.

Though Linux stocks are likely to remain scarce for a while, analysts were predicting last week that a successful debut by Red Hat would speed up other companies' IPO plans. Linux system vendor VA Research Systems in Mountain View, Calif., has already stated that it intends to go public before the end of the year. And the No. 3 Linux operating system vendor, Caldera Systems Inc. in Orem, Utah, has also hinted at an IPO. ◆

Red Hat Is Red Hot

Red Hat's IPO by the numbers



SOFTWARE UP 2.0%

EXCH	52-WEEK	RANGE		AUGUST 13 2 PM	WK NET CHANGE	WK PCT CHANGE
ADBE	93.62	23.62	Adobe Systems Inc.	89 38	2.75	3.2
AZPN	31.00	6.12	Aspen Technology Inc.	9.19	-1.44	-13.5
ADSK	49.43	21.62	Autodesk Inc.	24.13	-1.38	-5.4
AVIO	37.12	11.06	Avid Technology	12.69	0.44	3.6
BOBJ	49.50	6.12	Businesss Dbjects S.A.	46.25	7.25	18 6
CDN	36.00	9.12	Cadence Design Systems (L)	9.81	0.00	0.0
CBTSY	60.00	6.68	C8T Group Plc.	25.88	0.25	1.0
CHKPF	73.31	10.87	Checkpoint Software Tech.	67.50	3.81	6.0
CTXS	65.25	23.12	Citrix Systems Inc.	53.88	6.38	13.4
CDGN	28.12	14.75	Cognos Inc.	20.38	0.44	2.2
CA	58.00	26.00	Computer Associates Intern'l	48.06	3.31	7.4
CPWR	40.00	16.37	Compuware Corp.	26.31	0.13	0.5
DCTM	54.12	9.37	Documentum	14.94	0.25	1.7
EFII	60.37	13.50	Electronics For Imaging	55.13	0.38	0.7
HNCS	45.62	13.75	Hnc Software	34.50	0.75	2.2
IDXC	55.75	12.43	IOX Systems	18.94	-1.75	-8.5
IFMX	14.00	3.50	Informix Software Inc.	7.00	-0.03	-0.4
INTU	110.75	34.18	Intuit	79 63	2.75	3.6
JKHY	55.00	26.43	Jack Henry Associates	41.47	-0.53	-1.3
JDEC	49.50	10.87	J.O. Edwards & Co.	15.38	0.38	2.5
LGTD	82.81	27.50	Legato Systems Inc.	73.25	3.38	4.8
MACR	53.25	12.31	Macromedia Inc.	33.88	2.00	6.3
MANU	23.75	5.25	Manugistics Group Inc.	11.50	0.25	2.2
MENT	15.06	5.43	Mentor Graphics	8.25	-0.50	-5.7
MSFT	100.75	43.87	Microsolt Corp.	83.97	-1.53	-1.8
NETA	67.68	10.06	Network Associates	16.50	0.31	1.9
GMH	63.87	30.37	Network General	52.50	-0.31	-0.6
NOVL	31.18	9.50	Novell Inc.	25.00	0.75	3.1
DRCL	41.18	12.25	Oracle Corp.	38.25	1.44	3.9
PMTC	22.25	8.50	Parametric Technology Corp.	14.44	0.31	2.2
PSFT	37.75	11.50	PeopleSolt Inc.	14.25	1.13	8.6
PIXR	53.75	27.50	Pixar	37.63	-0.13	-0.3
RATL	40.00	10.50	Rational Soltware Corp.	31.94	2.31	7.8
SAP	57.31	23.75	SAP AG	31.88	1.56	5.2
SCUR	29.00	2.25	Secure Computing Corp.	3.06	0.00	0.0
SE	46.43	19.00	Sterling Commerce Inc. (L)	20.63	-0.88	-4.1
SSW	30.62	18.56	Sterling Software Inc.	22.19	-1.19	-5.1
SORC	23.43	7.50	Structural Dynamics Research	16.44	-0.50	-3.0
SYBS	13.37	4.50	Sybase Inc.	11.19	0.44	4.1
SYMC	32.25	8.68	Symantec Corp.	28.69	1.06	3.8
SNPS	63.25	24.50	Synopsis	59.06	1.44	2.5
SCTC	23.12	7.81	Systems & Computer Technology	15.44	0.44	2.9
8AANF	38.62	6.87	The 8aan Co. N.V.	13.00	0.56	4.5
VNTV	15.81	5.00	The Vantive Corp.	8.75	0.06	0.7
TSAI	51.00	26.00	Trans. Sys. Arch.	31.06	3.25	11.7
VRTS	63.43	11.87	Veritas Software Corp.	51.75	-2.50	-4.6
WIND	34.43	11.25	Wind River Systems Inc.	14.81	0.94	6.8

TELECOMMUNICATIONS CARRIERS UP 0.1%

EXCH	52-WEEK	RANGE		AUGUST 13 2 PM	WK NET CHANGE	WK PCT CHANGE
AT	75.00	39.06	Alltel Corp.	71.00	-1.25	-1.7
AIT	77.25	43.37	Ameritech Corp.	72.69	-0.56	-0.8
ANDW	22.87	10.37	Andrew Corp.	19.00	-0.94	-4.7
T	64.12	32.25	AT&T	48.75	-2.25	-4.4
8CE	52.68	25.62	8CE Inc.	47.81	1.31	2.8
8EL	66.93	40.43	Bell Atlantic	64.38	0.38	0.6
8LS	51.37	32.12	8ell South (H)	48.13	-2.50	-4.9
CSN	26.50	8.50	Cincinnati 8ell Inc.	19.88	0.31	1.6
CMCSK	42.56	16.81	Comcast	34.56	-1.44	-4.0
CQ	39.62	21.75	Comsat Corp.	35.25	0.00	0.0
COX	44.43	20.75	Cox Communications Inc.	35.06	-0.25	-0.7
GSTRF	33.00	8.31	Globalstar Telecom. Ltd.	28.25	0.75	2.7
GTE	78.50	46.56	GTE Corp.	75.25	0.88	1.2
NXTL	58.31	15.37	Nextel Communications	53.19	4.25	8.7
SPOT	53.62	26.37	Panamsat	36.34	0.72	2.0
QCDM	167.25	18.87	Qualcomm Corp.	156.44	10.38	7.1
SBC	59.93	35.00	S8C Communications	56.25	-0.94	-1.6
FDN	57.43	27.18	Sprint Corp.	54.38	4.69	9.4
TDS	79.37	30.62	Telephone and Data Systems	67.75	-2.63	-3.7
USW	66.00	47.00	US West	55.06	0.25	0.5
VIA	48.75	24.62	Viacom	42.44	2.19	5.4
WCII	64.43	10.25	Winstar Communications Inc.	45.50	-4.50	-9.0
WCOM	96.75	39.00	MCI Worldcom Inc.	78.56	-2.88	-3.5

SERVICES UP 1.8%

EXCH	52-WEEK	RANGE		AUGUST 13 2 PM	WK NET CHANGE	WK PCT CHANGE
ACXM	31.25	16.50	Acxiom Corp.	23.06	-2.94	-11.3
ACS	53.00	22.37	Alliliated Computer Servs	45.38	0.50	1.1
AMSY	40.25	19.25	American Mgt. Systems	29.00	0.13	0.4
AUD	46.87	31.75	Automatic Data Processing	40.50	0.75	1.9
BSYS	60.87	35.37	Bisys Group Inc.	51.50	1.88	3.8
CATP	47.00	10.62	Cambridge Technology Ptnrs	15.56	-0.38	-2.4
CEN	40.50	24.00	Ceridian	27.81	0.19	0.7
CBR	35.00	13.31	Ciber Inc.	19.88	2.06	11.6
CDO	30.87	10.75	Comdisco	20.56	0.44	2.2
CHRZ	37.87	9.25	Computer Horizons Corp.	12.94	1.31	11.3
CSC	74.87	46.25	Computer Sciences	65.75	-0.44	-0.7
DST	70.25	34.00	Dst Systems Inc.	67.63	2.94	4.5
EDS	67.37	30.43	Electronic Data Systems	59.44	1.25	2.1
FDC	51.50	19.68	First Data Group	47.75	-0.19	-0.4
FISV	40 75	24.62	Fiserv	28.81	0.63	2.2
IT	31.37	17.31	Gartner Group	20.94	-0.19	-0.9
KEA	58.25	17.25	Keane	23.63	1.06	4.7
NDC	55.25	26.18	National Data	40.19	1.63	4.2
PAYX	36.75	23.56	Paychex Inc. (L)	27.25	0.13	0.5
REGI	15.50	4.00	Renaissance Worldwide	5.91	-0.13	-2.1
REY	26.31	12.62	Reynolds & Reynolds	21.88	-0.13	-0.6
SFE	120.00	17.12	Safegard Scientilics	53.44	-2.69	-4.8
SAPE	82.87	24.25	Sapient Corp.	61.38	5.38	9.6
SMS	73.50	40.06	Shared Medical Systems	61.88	2.25	3.8
SOS	41.93	21.68	Sungard Deta Systems	26.81	0.31	1.2
SYNT	32.25	8.68	Syntel Inc.	28.69	1.06	3.8
TECD	53 12	14 50	Tech Data	32.63	-3.56	-9.8
TSS	26.25	14.43	Total System Services Inc	15.88	0.38	2.4
TSAI	51.00	26.00	Transaction Sys. Architects	31.06	3.25	11 7

NETWORK UP 2.8%

EXCH	52-WEEK	RANGE		AUGUST 13 2 PM	WK NET CHANGE	WK PCT CHANGE
CDMS	51.12	20.00	3Com Corp.	23.88	0 81	3.5
ADCT	53.62	15.75	ADC Telecommunications Inc.	43 75	3 00	7 4
ANTC	44.00	11.50	Antec	44 00	5.00	12 8
BNYN	19.37	2.12	Banyan Systems Inc.	7.06	-0.31	-4 2
CS	16.31	8 62	Cabletron Systems	13 81	1.38	11.1
CNEBF	14.00	3.93	Call-Net Enterprises	5.13	-0 19	-3 5
CSCD	69 25	20.56	Cisco Systems Inc.	63.00	0 69	1 1
ECIL	45.00	19 75	ECI Telecom	28 31	3 69	-11 5
HRS	40 62	27.31	Harris Corp.	28 69	-1.38	4 6
GMH	63.87	30.37	Hughes Electronics/GM	52.50	-0 31	-0 6
ERICY	34 12	15 00	LM Ericsson	30.75	0.06	0 2
LU	79 75	26.68	Lucent Technologies	66 13	1.75	2 7
MADGF	5 18	1.75	Madge Networks	2 75	0 25	10 0
NCDI	8.50	4.25	Network Computing Dev	4 75	0.25	5 0
NWK	17.00	7 31	Network Equipment Tech.	8 94	0.13	1 4
NN	39 87	15 43	Newbridge Networks	25 94	1.00	4 0
NOK	99 37	29 50	Nokia Corp.	85 94	4 94	6 1
NT	94 12	26 81	Northern Telecom Ltd.	85 63	3.50	4 3
PAIR	16 12	6.00	Pairgain Technologies Inc	10 13	1 44	16 5
PCTL	11 00	4 31	Picturetel	5 13	0.09	1 9
SFA	44 69	11 75	Scientific Atlanta	44 69	8 69	24 1
TLA8	74.00	15.68	Tellabs Inc.	61.69	1.44	2.4
USW	66.00	47.00	US West	55.06	0 25	0.5
VRLK	7.50	2 00	Verilink (L)	2 13	-0.25	-10 5
WSTL	11.18	2.75	Westell Technology Inc.	7.50	-0.06	-0 8

SEMICONDUCTORS, CHIPS & EQUIPMENT UP 4.4%

EXCH	52-WEEK	RANGE		AUGUST 13 2 PM	WK NET CHANGE	WK PCT CHANGE
ADPT	42.87	7.87	Adaptec	34 94	-2 69	-7.1
AMD	33.00	9 31	Advanced Micro Devices	18 69	1 69	9.9
ALTR	46.87	14.56	Altera	41.69	1.75	4 4
ADI	51.00	12.00	Analog Devices	47.75	2 44	5 4
AMAT	79 93	21.56	Applied Materials	70.56	-4 00	-5 4
ASML	69.62	12.93	ASM Lithography Holding	59 75	4 38	7 9
HRS	40.62	27.31	Harris Corp.	28 69	-1.38	-4 6
INTC	78.81	34 87	Intel Corp. (H)	78.81	6.31	8.7
KLAC	73.06	20.75	Kla Instruments	64 94	-4 41	6.4
LLTC	75.75	19.56	Linear Technology	65.00	4.00	6.6
LSI	57.00	10.50	LSI Logic (H)	57.00	3 25	6.0
MXIM	73.50	22.31	Maxim Integrated Products	69.31	4.44	6.8
MU	80.56	20.25	Micron Technology	82.63	-3.13	4 8
MOT	100.18	38.37	Motorola	92.06	3.38	3.8
NSM	29.18	7.43	National Semiconductor	27.81	4.19	17.7
STM	78 62	17.93	SGS-Thomson Microelectronics	74 69	5.75	8.3
SLR	73.25	19.37	Solectron Corp.	72.25	5.50	8.2
TER	80.56	15.00	Teradyne	70.25	-5.81	-7 6
TXN	155.37	45.37	Texas Instruments	148.63	5.44	3.8
JDSU	96.25	15.62	Uniphase	95.75	11.88	14.2
VTSS	73.87	17.12	Vitesse Semiconductor Corp	71.69	5.44	8 2
XLNX	71.25	14.87	Xilinx (H)	71.25	7.38	11.5

COMPUTER SYSTEMS UP 1.4%

EXCH	52-WEEK	RANGE		AUGUST 13 2 PM	WK NET CHANGE	WK PCT CHANGE
AAPL	61.06	28.50	Apple Computer Inc. (H)	61.06	5.94	10.8
ASPX	13.31	1.62	Auspex Systems	11.75	0.41	3.6
CPQ	51.25	20.00	Compaq	23.19	0 25	1.1
OGN	21.81	7.00	Data General	18.00	4.94	37.8
OELL	55.00	20.37	Dell Computer Corp.	41.13	1.38	3.5
GTW	84.50	36.12	Gateway 2000 Inc.	81.25	6.50	8.7
HWP	118.43	47.06	Hewlett-Packard Co.	106.50	-5.63	-5.0
HIT	109.93	40.18	Hitachi Ltd.	96.81	2.56	2.7
I8M	139.18	55.37	IBM	124.31	0.56	0.5
MUEI	24.75	9.00	Micron	9.81	0.00	0.0
MDT	100.18	38.37	Motorola	92.06	3.38	3.8
NATI	48.25	17.50	National Instruments Corp.	40.13	-0.94	-2.3
NCR	55.75	23.50	NCR	44.94	0.44	1.0
NIPNY	81 75	31.00	NEC	74 63	1.13	1.5
PRCM	13.25	3.43	Procom Tech Inc.	6.31	-0.69	-9.8
SQNT	19.00	5.68	Sequent Computer Systems	17.31	0.06	0.4
SGI	20.87	7.37	Silicon Graphics Inc.	11.38	-5.00	-30.5
SNE	126.94	60.25	Sony	126.94	7.94	6.7
SUNW	76.43	19.18	Sun Microsystems	72.88	2.25	3.2
TEXM	8.87	2.00	Texas Micro	7.63	-0.19	-2.4
TRCD	4.87	0.37	Tricord Systems	3.06	-0.25	-7.5
UIS	46.18	17.62	Unisys	41.00	1.50	3.8

INTERNET UP 1.5%

EXCH	52-WEEK	RANGE		AUGUST 13 2 PM	WK NET CHANGE	WK PCT CHANGE
AMZN	221.25	21.75	Amazon.com Inc.	95.31	3.88	4.2
AOL	175.50	17.25	America Dnline	96.06	10.44	12.2
ATHM	99.00	11.75	@home Corp.	37.56	-6.13	-14.0
CKFR	69.12	5.75	Checklree	31.25	5.38	20.8
CYCH	24.87	5.87	Cybercash Inc.	9.19	-0.19	-2.0
EOFY	16.87	3.81	Edify Corp.	9.25	-0.56	-5.7
EGRP	72.25	2.50	ETrade Group Inc.	25 88	-0.19	-0.7
SEEK	100.00	14.87	Infoseek	31.06	-0.44	-1.4
LCDS	72.68	10.12	Lycos Inc.	37.25	1.31	3.7
DMKT	27.00	4.25	Open Market Inc.	12 19	-0.69	-5.3
DTEX	42.50	10.00	Dpen Text Corp.	26.31	-0.56	-2.1
PSIX	73.75	8.37	PSINet Inc.	41.88	-3 75	-8.2
SOTI	30.62	5.43	Security Dynamics	19.00	1.69	9.7
SPYG	32.25	8.62	Spyglass Inc.	13.00	1.38	11.8
YHOO	244.00	29.50	Yahoo Inc.	131.19	0.31	0.2

STORAGE & PERIPHERALS UP 1.6%

EXCH	52-WEEK	RANGE		AUGUST 13 2 PM	WK NET CHANGE	WK PCT CHANGE
ADPT	42.87	7.87	Adaptec Inc.	34.94	-2.69	-7.1
APCC	27.75	13.12	American Power Conversion	19.81	-0.75	-3.6
CANNY	33.62	17.00	Canon Inc.	30.19	1.31	4.5
D8O	39.87	19.12	Diebold Inc.	26.81	-0.69	-2.5
EK	87.81	60.81	Eastman Kodak Co.	70.75	0.63	0.9
EMC	67.50	20.81	EMC	58.94	-1.75	-2.9
IDM	10.18	2.93	Iomega	4 13	0 19	4 8
LXK	74.37	25.37	Lexmark International Group Nc.	69.69	5.69	8.9
DSS	22.25	17.50	Quantum	21.38	2.31	12 1
SEG	44.25	16.12	Seagate Technology	28.88	0.75	2.7
STK	41.62	17.25	Storage Technology	19.69	0 81	4 3
TEK	32.87	13 68	Tektronix	32.00	1.25	4.1
XRX	63.93	39.00	Xerox	45.31	-2.44	-5.1

KEY: **(H)** = New annual high reached in period
(L) = New annual low reached in period

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MCI Outage

curring failures "unacceptable."

Sean Donelan, a senior network architect at St. Louis-based Data Research Associates Inc., said MCI's service has gotten worse over the past six months and his company is close to picking a new provider. He said MCI's upper management had yet to return his calls about the problems last week.

At press time, MCI officials said they hoped all customers would be back in service by Friday, but outages continued through the day. The problem first hit Aug. 5.

CBOT described the outage as "catastrophic." The electronic system that its overseas and overnight members use for trading went dark on Thursday, Aug. 5, and didn't come back up until last Tuesday. It went down again Friday.

"When you're talking about using technology, you anticipate a certain level of glitches and problems. But not having a market for five days is something else entirely," said Katherine Spring, a CBOT spokeswoman.

"MCI needs to hear that customers are not happy," said Bill Bartkus, vice president of information systems at Travel Centers of America in Westlake, Ohio. The outage "has been pretty significant for us." Thirty percent of its truck stops were without service Friday afternoon.

Travel Centers of America uses the frame-relay network for credit authorization and client/server access to ERP systems from SAP and PeopleSoft Inc. The enterprise resource planning systems handle administrative functions such as managing personnel and product ordering. The company has backup systems with Integrated Services Digital Network in some areas and dial-up in others, but it has been forced to do "a lot with fax machines and the phone right now."

Travel Centers of America plans to compile an estimate of the losses derived from the poorer customer service it has been forced to offer and the loss of productivity from being cut off from its ERP systems, Bartkus said. It will submit that through the reseller to MCI.

"Giving credit for downtime is now what these people want. They want reliable service," said Rosemary Cochran, a principal at Vertical Systems Group in Dedham, Mass.

Though MCI has been mum on the causes of its network congestion, it did alert customers to a software upgrade on Aug. 5. On Aug. 6 it announced some congestion, and on Aug. 9 it notified users it was incurring some service interruptions.

MCI spokeswoman Linda Laughlin would say only that the problem was still under investigation by technical teams at the carrier and at the vendors that provide key technology to run the network, Lucent Technologies Inc. and Bell Labs. Lucent spokesman John Callahan confirmed that a bug plagued the software that MCI purchased from his company.

But user anecdotes suggested that the problem may have multiple causes.

Donelan said a call to MCI prompted a laundry list of reasons: congestion, a Y2K software upgrade, switches toggling on and off, an OC-12 fiber outage between New York and Illinois, virus checks and the shutdown of Ethernet ports and high-speed ports.

"As a result of the AT&T outage three years ago, customers should be more aware of the fact that these networks are not infallible," said Liza Henderson, a consultant at TeleChoice Inc. in Tulsa, Okla. "Although frame-relay networks have inherent automatic rerouting capabilities, they're not 100% fault-tolerant." ◗

AT A GLANCE

CBOT Trials

Company: Chicago Board of Trade

Outage: Aug. 5, 9:21 p.m., to Aug. 10, 2:15 p.m.; another outage occurred Aug. 13

Result: Electronic trading system was shut down

Losses: About 45,000 contracts per day

Continued from page 1

GM on Internet

notch Internet experts" to add to an existing IT group comprised of GM employees and several outside systems integrators, including Electronic Data Systems Corp. in Plano, Texas.

Last week, the $160 billion car company said the new e-GM will oversee all new and existing e-commerce and Internet-related activities, including research and development, manufacturing, sales and financing.

The new 300-person division will develop Internet applications for GM vehicles and their manufacturers. Next month, for example, e-GM will test-market a new "Web car," which will provide drivers with voice-activated Internet access through the automaker's OnStar system. GM said it plans to sell Web cars before the end of next year.

"Empowering this business group to focus all of its energy on e-business allows us to move at the speed of the Internet," said Mark Hogan, the newly appointed head of e-GM. "We're going to move like nobody's ever seen people in GM move before."

"We have many different products. We're selling parts, vehicles and financing over the Internet. What we're looking to do is package those things under a single billing system for multiple products," Szygenda said. There's a whole set of other systems that would have to be integrated to connect suppliers to plants where the cars are manufactured.

That entails integrating all the systems that support those products plus creating a single customer record accessible at the company's centralized Internet portal, *www.gm.com.*

Szygenda said GM already has a head start with its Web-based BuyPower system, which lets customers seeking cars conduct online searches of dealerships' actual inventories. This integration effort began two years ago. Currently, all of the automaker's 6,000 U.S. dealers are tied into BuyPower. Its other 9,000 worldwide dealerships will be linked over the next several months.

"It isn't like yesterday was the begin date for a lot of this technology," Szygenda said. "We've had our North American and Latin American operations and CIOs throughout the world working on this for a while. This has been kept pretty quiet."

Bob Schnorbus, a Detroit-based auto industry analyst at J. D. Power & Associates in Agoura Hills, Calif., said GM "has always tended to focus on technology," which in the past has given the company a leg up on its competitors. GM's in-car OnStar system is a prime example.

That technology focus should also place it out front in the upcoming Web-car race. GM said it plans to make its OnStar system and car-based Internet access standard on several models within the next few years.

"With everyone looking more to their vehicle as their office, you obviously need Internet access," Schnorbus said. "What looked like science fiction stuff five years ago is increasingly becoming a part of the vehicle and will eventually become standard," he said (see story at left).

"Where I see GM at a disadvantage," Schnorbus said, "is with the number of different brands they have to deal with and trying to develop a distinct [Internet] brand image for each of them." ◗

E-GM's Internet Agenda

CENTRALIZE more than 100 separate GM Web sites into a single GM.com portal, accessible globally

INTEGRATE front-end Internet sales and service systems with back-end supply-chain and manufacturing systems

PROVIDE CUSTOMERS with one-stop electronic shopping and billing for GM cars, mortgages, car financing and other products and services

TEST A "WEB CAR" this fall that will give drivers voice-activated Internet access

Surf While You Drive

Forget a corner suite with a bay window and great view. At Sun Microsystems Inc., salespeople get a big car and plenty of mobile technology to conduct business.

"I no longer give my sales reps an office. I just give them a nice Cadillac. It's way cheaper," said CEO Scott McNealy, a huge fan of GM's plans to cram more Internet-based services into its cars.

"GM really gets it," he said during last week's press conference announcing the creation of e-GM. "People spend 80 minutes a day in their cars – all dashboard hours that GM has captive. This is the very kind of eyeball hours per day that would make NBC or Fox quite jealous."

GM said it will begin test-marketing a so-called Web car next month. The car offers voice-activated Internet access through GM's OnStar in-car communication system. By the end of 2000, the Internet service will be standard on several high-end models and come as part of an option package on other models.

OnStar is GM's satellite-based communication system that now performs such diverse tasks as giving directions and alerting emergency rescue teams when an airbag deploys. GM said it completed pilot applications of virtual adviser voice connectivity to the Internet via the OnStar system in June.

OnStar is now available in 31 GM models, including Cadillacs, and has 75,000 subscribers. Thanks to the Internet option, GM expects to sign up more than 1 million subscribers by the end of next year. – *Julia King*

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ABC ABP RED TAG

FRANK HAYES/FRANKLY SPEAKING

Hacker lessons

YOU CAN LEARN a lot from hackers. No, seriously. And not just how to send fake e-mail or sneak around a firewall. Consider the Linux Death Match, a competition that was part of the Chaos Communication Camp a week ago in Altlandsberg, Germany. Teams of network administrators, all expert hackers, attacked one another's servers, trying to knock out network services. But the winning team, from Munich, Germany, wasn't the one with the most devastating attack strategy. It was the team that bulked up its server with extra security.

Wait, the story gets better. According to *Computerworld* security reporter Ann Harrison, who camped out with the 1,800 hackers from around the world (see stories, page 24; you can read more at *www.computerworld.com*), the winners were convinced from the start that they were doomed. They couldn't win. They didn't have a devastating attack strategy. They didn't even know much about Linux, the operating system on the server they would be using. In short, they were toast.

Or to put it another way, they were in about the same position as most corporate IT people who are faced with the task of protecting their systems against outside attacks.

So what did these less-than-stellar hackers do? They just piled on the security, in the form of FreeBSD software.

It worked. They won.

The best defense, it seems, is a *lot* of defense.

Hackers understand what really matters in running a system, and they actually share many of the same priorities we have — or should have.

It might surprise you to learn that the way to score points in the Linux Death Match wasn't by knocking out your opponent's system. You scored points by keeping your own server up, running and providing network services.

Which, after all, is also what matters to us.

The winners realized they weren't experts. They understood that they didn't know as much about their vulnerabilities as their attackers did. So instead of trying to become instant security gurus, they paid attention — a lot of attention — to what really matters.

We can do that, too. Maybe every hacker, cracker, industrial spy, saboteur and antisocial seventh-grader knows more about the vulnerabilities of your systems than you ever will. And maybe you can't afford to hire big-name consultants and network security geniuses.

But you can keep firewalls and server patches and antivirus software up-to-date. You can scan access logs to watch for evidence that someone is probing your systems. You can make sure you're current on tools, free or otherwise, that can be used to attack and defend your machines. You can tune your servers to limit the information they send out about your systems. You can make checking for easy-to-crack passwords as much a part of your routine as making backups.

And you can pay attention to reports of attacks on the Web sites and networks of your competitors (word gets out through news Web sites and Internet newsgroups) and your sister companies (there should be a formal way of getting this information, but the corporate grapevine is probably faster and more accurate). Where there's a hack, there's a hole. You can find and close it on your own systems.

None of this stuff is rocket science. It's good, basic security practice. It's also the stuff that won the Linux Death Match by holding off some of the smartest, most dedicated hackers in the world.

So if you want to beat back your own attackers, learn from the hackers. Otherwise, you really *will* be toast. ◗

> *Don't try to become an instant security guru; pay attention to what really matters.*

Hayes, Computerworld's staff columnist, has covered IT for 20 years. His e-mail address is frank_hayes@computerworld.com.

SHARK TANK

SOUNDS FAMILIAR, PART 1 A chemical company hired a "major Lotus business partner" for a little consulting work. It needed to get an NT image server to talk to an AS/400 Web server, smooth over a few security issues. No big deal. A 15-day contract. Well, that was 15 months ago. A staff IT guy and friend of the Tank smelled trouble at the first meeting, where "the lead consultant spewed solutions that made it clear he didn't have a clue." Our IT guy had some ideas of his own, but naturally he was told to hush up, lest he disturb the fragile geniuses. But our trouper recently quietly e-mailed his solution (again) to the consultants, "and I fully expect it will be accepted in the next meeting as *their* idea," he says.

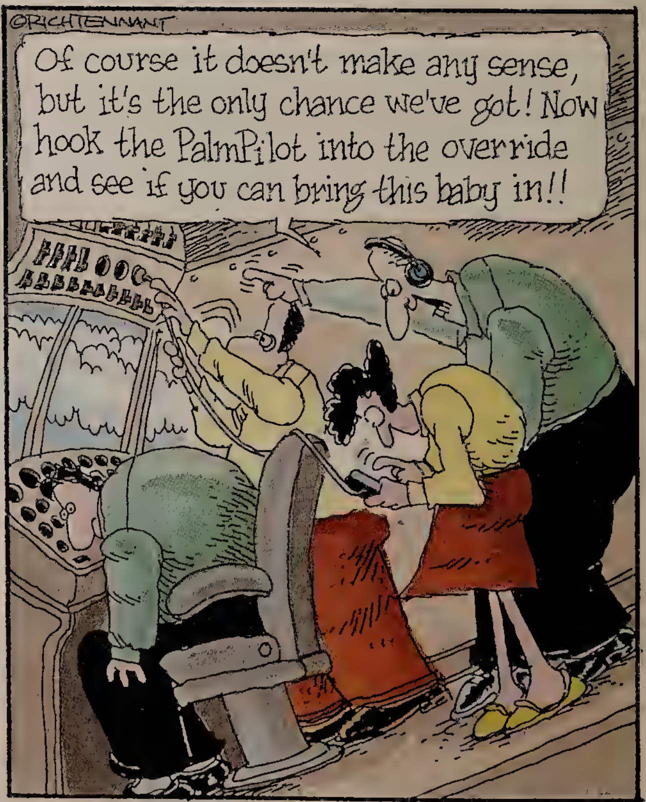
SOUNDS FAMILIAR, PART 2 "The only time we hear from anyone is at the top of their lungs." That quote come from a Defense Department IT director. Hope he doesn't think things are any different out here in the private sector.

NOT EVERYBODY has a crush on HP's go-go Internet focus (see story, page 1). A pilot fish whispers that some members of Interex, the hardware-focused user group that relies on HP for funds, feel that the mothership is quick-stepping them toward a reorganization they don't much like. The pilot fish thinks there may even be a mutiny at this week's HP World in San Francisco. Will the hardware guys split off from the e-guys? Who knows? But the Shark wagers that Wednesday's 1:15 Interex Business Meeting might be better than your average user group snoozathon.

ARE H-1B VISAS a big watercooler topic at your shop? Of course not. If you suspected the whole business was a way for vendor companies to hire cheap help, you've got friends in Washington (not that that's a comforting thought). A House committee recently invited five unnamed high-tech companies to testify on a visa bill (they again want to raise the number of foreigners allowed in). It seems Congress wanted to know if the vendors are *really* doing all they can to hire U.S. citizens. Not one of the vendors showed up.

Funny, vendors never show up when Sharky summons them, either. Prove they're right: Shoot your horror stories to **sharky@computerworld.com.**

The 5th Wave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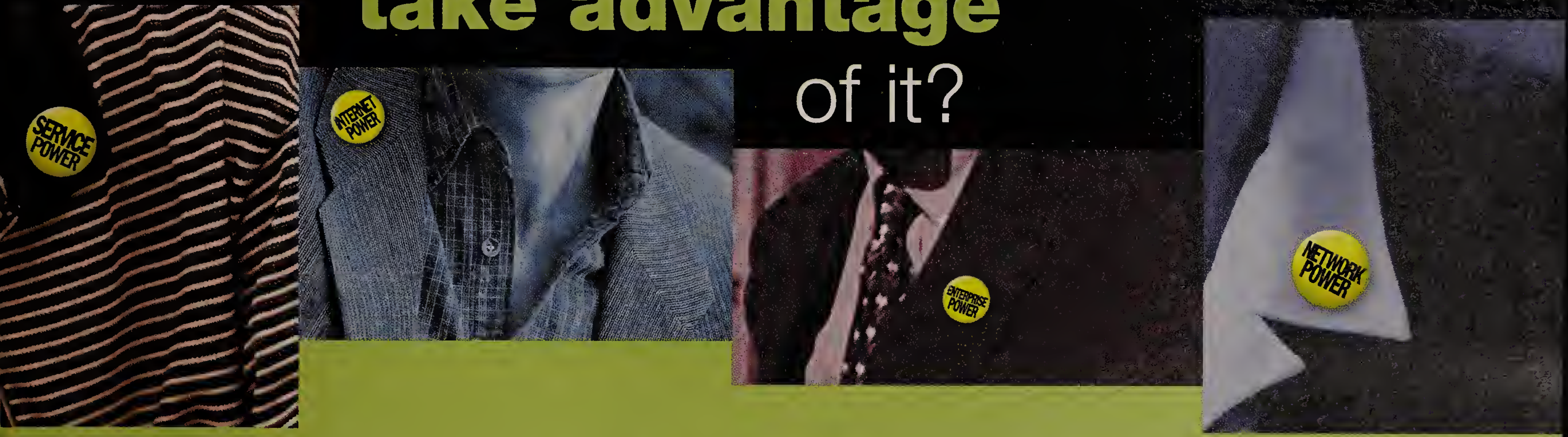

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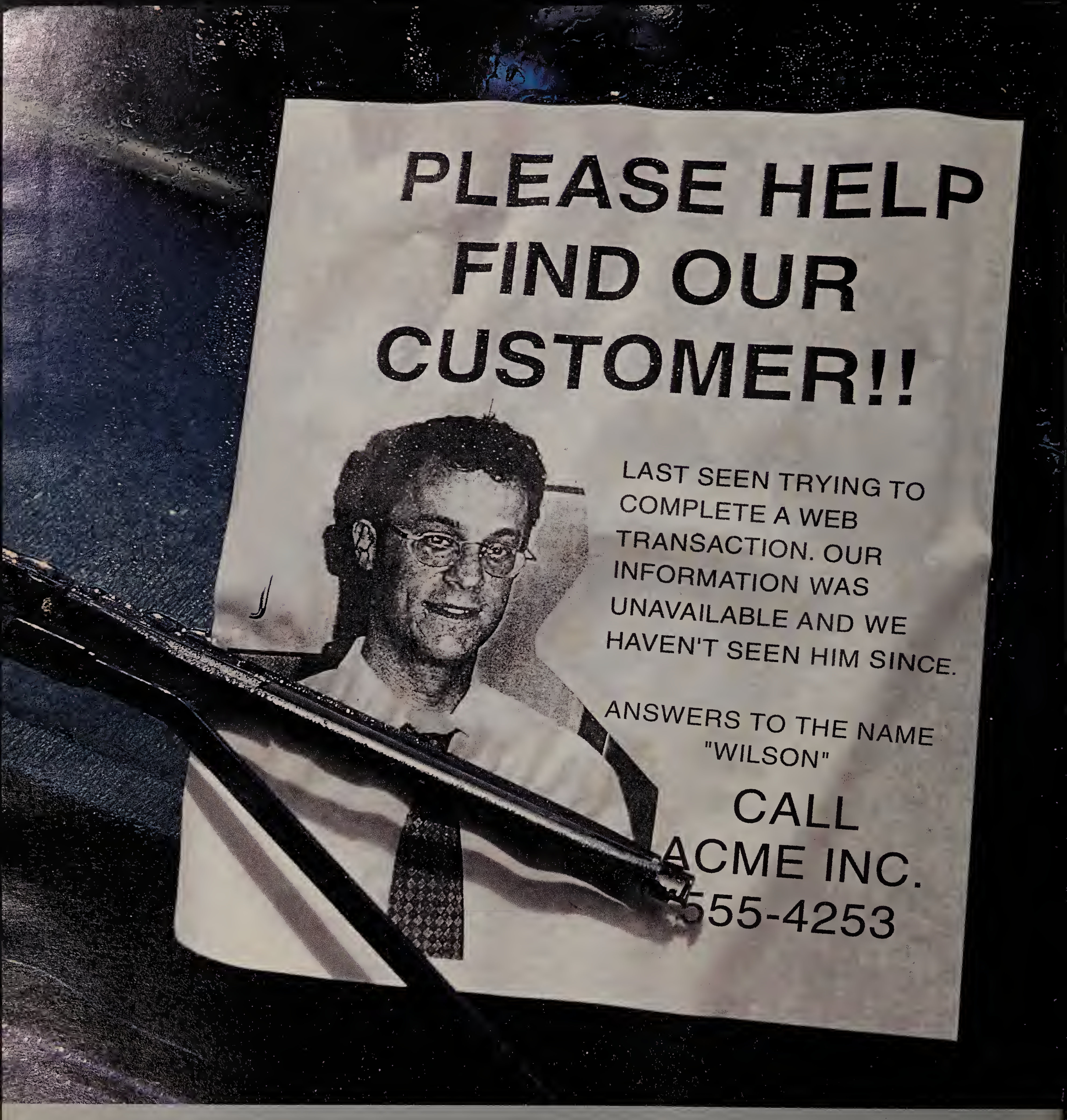
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